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COMPUTERWORLD

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Santa's helpers: MIS greets seasonal rush

BY KATHY CHIN LEONG
CW STAFF

Waiting in checkout lines longer this holiday? Then someone in MIS goofed.

Swift processing with no bottleneck from the store terminal to the host mainframe characterizes this season's goal for MIS shops at retail stores and credit card companies. While store merchants mapped out sales strategies early in the year, MIS directors completed systems planning months in advance to prevent major systems disasters.

"We live for this peak season," stressed Robert Menar, president of Carter Hawley Hale's Information Services Division in Anaheim, Calif. "Our entire focus is on supporting our highest volumes this time of year." Menar's division exclusively services its own retail stores, including Neiman Marcus, Broadway and Emporium Capwell.

Retail spending will dip almost 2% this Christmas as a result of an uncertain economic climate, according to projections by consumer analysts. Yet credit card and retail industries are not taking any chances.

For both businesses, "credit card authorization represents *the* key application," Menar said. "It is critical."

Fred Koloski, vice-president of data services at Macy's California, Inc. in San Francisco, said, "People are already waiting in long lines. If your credit network goes down,

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'Charge it!'
Annual growth in transaction volume on Visa U.S.A.'s worldwide network demonstrates the need for advanced systems planning

	Number of transactions in billions
1983	1.5
'84	1.8
'85	2.08
'86	2.3

INFORMATION PROVIDED BY VISA U.S.A., INC.
CW CHART

Lotus pencils in details on DBMS sketch

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. intends to catch the SQL wave with a server-oriented data base that includes both a 1-2-3 front end and a proprietary Lotus programming language. But the product, code-named Lotus/DBMS, may not feature access to IBM's DB2 and other data bases until future enhancements are made.

Lotus/DBMS

- Requires OS/2 Presentation Manager
- Runs on workstation or server
- Access to DB2 and other host data bases to be provided in future enhancements
- Uses SQL-based engine
- Application development uses LEAF
- Direct interface to 1-2-3 Release 3 and 1-2-3/G

Lotus announced the data base manager in late April [CW, May 4] but provided little detail at the time. Last week, in an interview with *Computerworld*, a Lotus official confirmed several features that will be included.

The server product, which sources said is based on core technology licensed from Gupta Technologies, Inc. in Menlo Park, Calif., will be available after the shipment of IBM and Microsoft Corp.'s OS/2 Presentation Manager, slated for October 1988. The Gupta product is already available.

Lotus intends to leapfrog the single-user data base market currently dominated by Ashton-Tate Corp.'s Dbase and to attack the emerging market for data base server products.

That strategy may also help Lotus avoid some direct competition with Dbase in the single-user marketplace, in which much development effort and training have been invested in the Dbase language. Lotus, however, will also reportedly release a version that runs solely on a single workstation. With the server-based product, a full-blown SQL engine will reside on the server, and end-user tools will reside on the PC.

Unlike the current Gupta product, which is aimed at sophisticated applications developers and data processing professionals, Lotus/DBMS will have a

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NEWSPAPER

SECOND CLASS

Uccel bank line lives

Computer Associates plans aggressive overhaul

BY ROSEMARY HAMILTON
CW STAFF

Computer Associates International, Inc. has a major face-lift under way for its newly acquired banking software line in a move that will bring big changes to the company's more than 800 user sites.

The multipoint plan that the company outlined last week contradicts speculation that Computer Associates will discard the 28 applications it acquired with the purchase of Uccel Corp. earlier this year.

Some observers said at the time that Computer Associates was interested mainly in Uccel's systems software. But Mark Wasilko, a senior vice-president in the applications products division, said the company not only is committed to Uccel's banking products but also intends to do more with them than Uccel did.

Mix and match

Computer Associates' various projects blend products from four acquisitions into existing Uccel banking applications. Plans include the following:

- New life for Uccel's troubled Infoloans project. Computer Associates declared it will get the product to market — which has been a question in itself — and also incorporate its Masterpiece Masterhost environment to provide a common user interface throughout the integrated loans package.
- Masterhost, which Computer Associates obtained with the acquisition of Software International Corp., will be incorporated into the entire banking product line at no additional charge to users.
- Integrated Planning, Inc.'s Stratagem, a fourth-generation language, data base and decision-

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Barbs draw IBM pledge on Netview

BY ELISABETH HORWITT
CW STAFF

RALEIGH, N.C. — Hoping to boost Netview's sagging credibility as a distributed multivendor network management system, IBM is planning major software announcements during the next 18 months.

The introductions will address customer demands for more automated operation, better communications with non-IBM networking systems, more distributed management and easier tailoring of applications, IBM research and development representatives told *Computerworld* last week.

Upcoming IBM products designed to address these demands include the following:

- An IBM OS/2 Extended Edition version of Netview, which will allow IBM Personal System/2s to act as local Netview hosts for other PS/2s and for IBM Personal Computers.
- An OS/2 Extended Edition version of Netview/PC.
- High-level Netview programming languages.
- More complete IBM LU6.2 peer-to-peer communications for distributed Netview nodes.
- A consistent, graphics-based

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RICK RICHARDSON
ARTHUR YOUNG

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Pirates' flag struck

Software vendors band to stage Hong Kong raid

BY STEPHEN JONES
CW STAFF

It had all the makings of a classic Hollywood spy thriller, complete with undercover gumshoes, modern-day bootlegging pirates and a crack team of 60 government agents to save the day.

But instead of being played out on a Hollywood back lot, this recent sting operation took place on the streets of Hong Kong. And instead of being orchestrated by chic producers and directors, the setup was planned by an unlikely team of top U.S. software and hardware vendors.

The companies — from Ashton-Tate Corp. to Apple Computer, Inc. — have banded together to take a hard line with international software pirates that sell cheap clones of popular microcomputer applications on the black market.

$1 billion void

Bootleg programs have meant big business for international pirates and headaches for U.S. companies. Ken Wasch, executive director of the Software Publishers Association in Washington, D.C., estimated that the U.S. software industry would be at least $1 billion larger if not for international piracy.

To check the spread of such copycat antics, industry leaders last month formed the Business Software Association, an organization designed to take down the pirate flag once and for all. Members include Microsoft Corp., Ashton-Tate, Lotus Development Corp. and Wordperfect Corp.

The group's first target: Hong Kong, long considered a clone-making hotbed for everything from Levi's jeans to personal computers. Weak enforcement of copyright protection and questions about the authority of intellectual property laws have made the area ripe for counterfeit software.

Led by Ashton-Tate's deputy general counsel, Thomas Chan, the software association hired a group of Hong Kong private investigators who traced phony software to nine different supply houses on Hong Kong island, Kowloon and outlying areas.

Armed with almost 600 hours worth of undercover information, the Hong Kong Customs and Excise Department recently dispatched 60 of its agents on a series of raids of the warehouses and retail outlets, Chan said.

Ten alleged bootleggers were arrested, and more than 20,000 copies of Ashton-Tate's Dbase III Plus, Lotus's 1-2-3, Wordperfect's Word Perfect and Microsoft's MS-DOS were seized. Chan estimated that the haul represented only about two weeks worth of the software that makes its way through the Crown Colony.

While federal officials have reported similar counterfeiting syndicates in Brazil, Taiwan, Australia and Canada, Hong Kong is considered the most flagrant violator of copyrighted material. Ashton-Tate said that for every copy of its software sold in Hong Kong, 10 bootleg versions are sold at a fraction of the price.

"Hong Kong has a reputation as the place where, if intellectual property was there to be stolen, it would be stolen," Wasch said.

If Hong Kong is the supply house for counterfeit software, then the Golden Arcade, a rundown shopping complex in the region's worst section, is its retail arm.

Chan said that out of the 60 tiny stores jammed into the three-story shopping mart, at least 30 specialize in bootleg software. Cut-rate prices draw locals and tourists to the seedy neighborhood, where programs that would cost between $400 and $800 in the U.S. can be bought for as little as $10.

Buyer beware

Industry officials warn, however, that phony software is not always such a great deal.

The programs are prone to failure because they are copied on cheap or used disks, and documentation usually consists of incomplete, photocopied manuals. Older versions of programs that are frequently updated, such as Autodesk, Inc.'s computer-aided design software, are often sold on the black market as the latest souped-up release.

"We stand to gain a lot from stopping the pirates, but it's really a matter of protecting the customer," said Chris Record, vice-president and general counsel for Autodesk, which is also a member of the Business Software Association.

Chan said the recent raids in Hong Kong indicate a shift in attitude of local authorities there and show that more assistance from the Hong Kong Customs department is on the way.

U.S. federal efforts might also help stop piracy in countries such as Brazil, which has been hit with a number of tariffs designed to open Brazilian markets to U.S. software companies.

In the meantime, the software industry plans to tear another page out of the Hollywood cloak-and-dagger genre. Their next target is expected to be the crowded and mysterious streets of mainland China, where the bulk of Asia's bootleg programs are believed to be printed.

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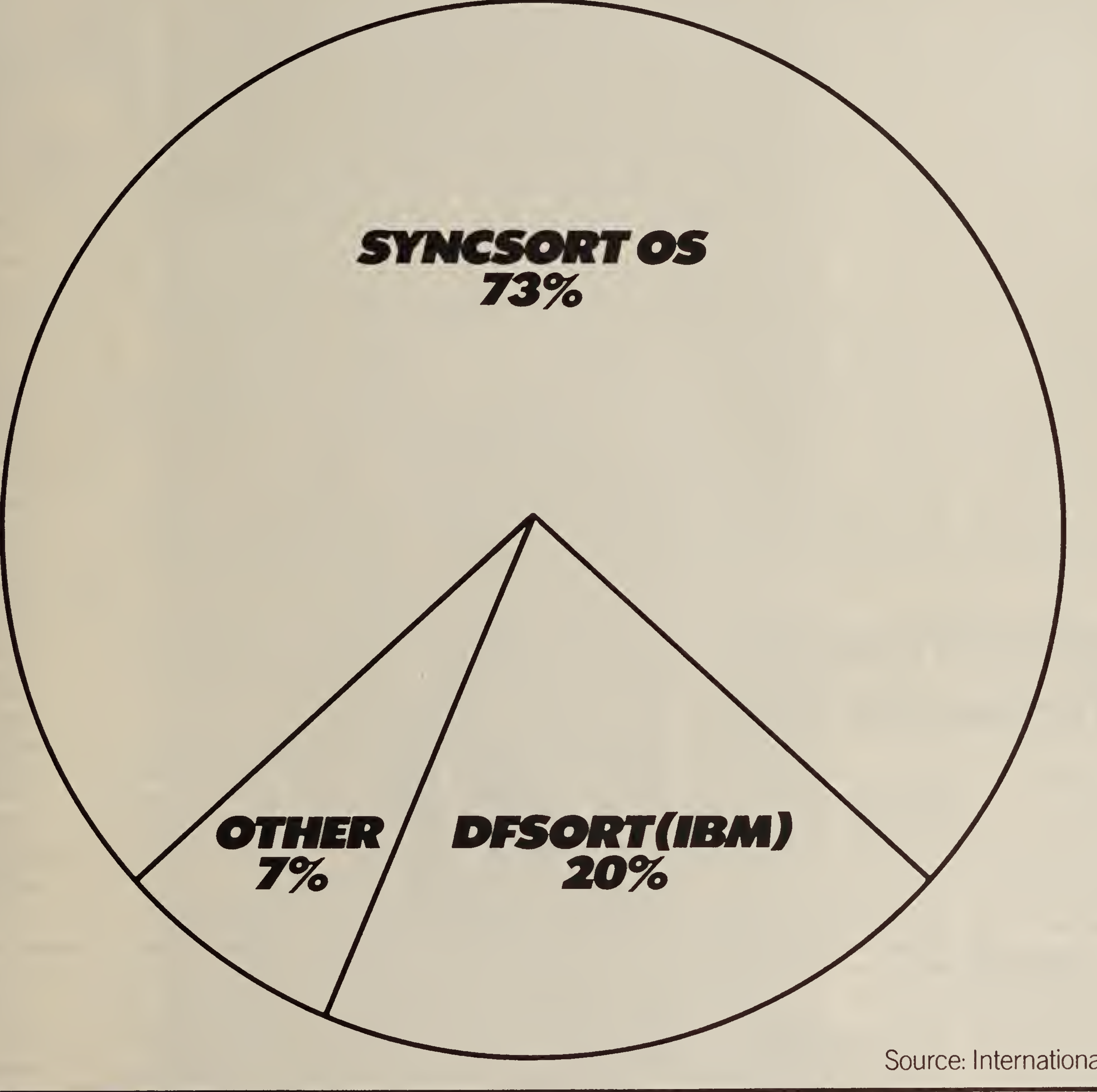

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R:Base gets SQL — in part

Models feature better performance, more LAN capabilities

BY ED SCANNELL
CW STAFF

REDMOND, Wash. — Microrim, Inc. last week announced versions of its R:Base data base for the Microsoft Corp. MS-DOS and OS/2 operating systems that feature partial implementation of SQL, increased performance and improved local-area network capabilities.

Both R:Base for DOS and R:Base for OS/2 have several SQL commands embedded, most of which adhere to the standards laid down by the American National Standards Institute (ANSI). The products also have several extensions based on IBM's DB2 relational data base.

Microrim decided not to put a full implementation of SQL into the products because it was not appropriate for the needs of the vast majority of R:Base users, according to Fred Gray, Microrim's senior vice-president of research and development.

"We talked to about 200 companies who told us they would rather see an implementation that solves 95% of their problems now than wait 12 months to get a 100% implementation," Gray said.

Other reasons for not providing a full implementation are that the ANSI standard is still in flux and the influence of the SQL data base within IBM's OS/2 Extended Edition, which is due out next year, cannot yet be measured.

Ready and waiting

One analyst disagreed with Gray's assertion, saying that most users are ready for a full SQL implementation. He pointed to companies that have produced full SQL implementations — such as Oracle Corp. with Oracle and Relational Technology, Inc. with Ingres — whose sales have done well recently.

"Users I talk to, and certainly all government agencies, are requiring full SQL," said Rich Finklestein, vice-president of Codd and Date Consulting Group's central region.

Microrim users, however, generally agreed with Gray that the company had incorporated the appropriate number of SQL commands. Most said only a small minority of users in their companies need a full SQL implementation now, although some thought they would need one eventually. "If they had taken the time to do the rest of the SQL implementation, I'm not sure it would have bought them any more functionality. The rest of the world isn't there yet," said Cheryl Currid, an MIS manager with Coca-Cola Foods.

"It's well thought out, particularly in the choice of commands to implement from the ANSI standard, which [commands] to exclude and, most importantly, the commands added that aren't in the standard," said Jerry Schneider, president of the Capital PC User Group, Inc.

SQL commands in R:Base include data definition language commands such as Create Table and Create View and data manipulation language commands such as Select, Grant and Revoke.

The program also has Exists, Like, Null and Union commands. Union, however, is not implemented in the standard SQL manner; it takes two different tables and creates a new one. The product also has a Join command but allows users to pull information from five tables, not an unlimited amount.

Written completely in C, R:Base can do sort, view and crosstab operations up to 20 times faster than previous versions because of its heuristic query optimization. The products also support the Lotus/Intel/Microsoft Expanded Memory Specification.

The programs also feature a "pseudocompiler" called Express that lets developers compress and encrypt program code, allowing applications to run directly off the R:Base engine. Express allows R:Base applications to run two to three times faster than interpreted applications, a company spokesman said.

The 'deadly embrace'

The improved multiuser capabilities of the programs include simultaneous data base or table access with either the R:Base automatic locking mechanism or explicit locks and full protection against "deadly embrace" with a "time-out" lock release.

R:Base for DOS supports up to three simultaneous users on a network at no extra charge. R:Base for DOS Network Six Pack supports six users as a single network or as an addition to an existing R:Base network.

R:Base for DOS, which packs 5¼- and 3½-in. disk versions in the same package, will be offered as an upgrade to R:Base System V until June. Users who subscribe to one of Microrim's support services can upgrade to R:Base for DOS for $50.

The suggested retail price of R:Base, which reportedly will be available next month, is $725; R:Base for DOS Network Six Pack costs $995. R:Base Network Unlimited costs $2,695.

R:Base OS/2 is scheduled to ship by the end of first-quarter 1988. The company said it would announce price at delivery time.

EDI apple of Pentagon, IBM, Fortune 500's eyes

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The electronic data interchange (EDI) market showed signs of maturing at the 19th National EDI Systems Forum and Exhibit last week.

IBM made a strong verbal commitment to EDI, the Department of Defense endorsed the ANSI X.12 EDI standard and vendors said Fortune 500 corporations are starting to invest in mainframe EDI software.

Two thousand executives from EDI vendors and user firms attended the show, up 30% from last year, according to its sponsor, TDCC-The Electronic Data Interchange Association. EDI is the computer-to-computer exchange of data for business transactions, such as purchase orders and invoices.

Edward E. Lucente, an IBM vice-president and head of the Information Systems Group, said in a keynote speech that IBM plans to become a more vigorous competitor in the EDI market via its Information Network, a Systems Network Architecture time-sharing service based in Tampa, Fla.

IBM is already a major user of EDI internally and plans to have electronic links to its 12,000 largest suppliers by 1991, he said. "Doing business without EDI will soon be like doing business without a telephone," Lucente said.

'The sleeping giant'

In the past, IBM has merely dabbled in the EDI marketplace as a vendor, several observers noted. "But the sleeping giant is starting to wake up," said Jack Shaw, president of EDI Strategies, Inc., a consulting firm in Marietta, Ga.

Shaw predicted that several more corporations will join the field as value-added networks. "There could be 15 to 20 networks in the next few years. That will make the EDI market grow faster, but it will also make interconnection more of an issue," he said.

IBM's Edward E. Lucente

Officials from Telenet Communications Corp. in Reston, Va., the latest firm to enter the EDI market [CW, July 27], said they have signed on several EDI customers, including Ball Corp., a $1 billion manufacturing firm in Muncie, Ind.

In addition, there has been an increase in the number of EDI software packages available for mainframes, Shaw said. "It's a sign of the beginning of the maturation process" for EDI, according to John Barber, manager of EDI programs for GE Information Services, a unit of General Electric Co. in Rockville, Md.

Companies that first experimented with EDI using microcomputer software are now graduating to bigger investments in mainframe software, Barber explained. "Fortune 500 companies are starting to take EDI seriously," he said.

GE Information Services has already sold 75 copies of its EDI translation software for minicomputers and mainframes, Barber said. The software was released in June.

The vendor last week introduced Version 2.3 of the EDI-T package, which acts as a bridge between a company's in-house application and public EDI standard formats. The initial fee is $9,500, with an annual renewal fee of $1,200.

Other EDI announcements included the following:

- Ordernet Services, a division of Sterling Software, Inc. in Columbus, Ohio, announced the availability of its Gentran translation software for IBM mainframes. The initial fee is $25,000, with a $3,000 annual renewal fee.
- Metro-Mark Integrated Systems, Inc. in Roslyn Heights, N.Y., announced translation software for IBM MVS mainframes. The initial fee for Translator-MVS is $25,000, with an annual renewal fee of $3,750.
- ACS Network Systems, Inc. in Concord, Calif., said its EDI software for IBM System/36 and 38 computers now has software links to all major EDI carriers, including Ordernet, McDonnell Douglas, EDI Systems Co., Control Data Corp.'s Redinet, IBM's Information Network and GE Information Services.

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IBM cuts price to move used systems

BY STANLEY GIBSON
CW STAFF

IBM has quietly reduced its charges for performing deinstallation and reinstallation of equipment by 40%. Although the cut became effective Oct. 1, IBM did not announce it publicly or in a customer letter, an IBM spokesman said.

"IBM would like to do more deinstallation and reinstallation business. IBM rates were just too high," said Wilson Lowery, IBM vice-president of service business development. "We have been concerned with our costs, and we wanted to get our offerings to be more competitive."

Richard Forsythe, chairman of the IBM relations committee of the Computer Dealers and Lessors Association (CDLA), said he welcomed the change but that he first heard of it at a meeting of IBM and CDLA officials at IBM headquarters in Armonk, N.Y., on Nov. 23.

"CDLA was pleased to hear this, because it reduces the cost of remarketing used equipment," Forsythe said.

He added that his own company, Forsythe McArthur Associates, Inc., would be happy to use IBM to perform deinstallation and reinstallation.

"This takes away price as a criterion for selecting a vendor," he said.

Third-party charge

CDLA members and IBM representatives plan to meet this week in Chicago to hammer out a new policy on requalifying equipment for the IBM Maintenance Agreement, according to Forsythe.

On Nov. 3, IBM announced that third parties performing deinstallation and reinstallation would have to pay IBM a month's maintenance charge or hourly fees for diagnostic tests in order to requalify a piece of equipment for IBM maintenance.

The company's previous policy was to charge only for correcting the results of work not performed by IBM; correcting the results of warehouse deterioration or visible transit damage; or replacing missing parts or parts not furnished by IBM that required replacement.

Despite its policy of recovering expenses in those cases, IBM still had to pay for repairs on a small percentage of machines that would not run for other reasons, Lowery said.

After the CDLA objected to the new policy, which was scheduled to become effective Dec. 1, IBM postponed the date until March 1 and agreed to discuss possible alternatives with the association.

"The goal is to come to a decision on a new policy soon, not to discuss it for the next three months," Lowery said.

Find the cost

The new fees were proposed to recover IBM's costs, according to Lowery.

"When we relocated equipment, sometimes the equipment did not run when it was reinstalled, and we had to absorb the costs of fixing that," Lowery told *Computerworld* last week.

"There have been some unscrupulous people who took out good parts and replaced them with bad parts," he added, indicating one possible cause of malfunctions.

Who pays?

"We want to recover any unique costs caused by equipment relocation. We don't want to take that cost and, by spreading it to other expenses, charge it to any other customer. We don't want to be paying [for] costs [incurred by] anyone who has stuffed bad parts into a good machine," Lowery said.

"We feel IBM does have a problem here. They have an expense without a revenue," Forsythe said. "They are trying to increase their revenue. They could also decrease the expense. Now you are penalizing the innocent, not the guilty."

But, he added, "I'm optimistic that both parties are going to come out of this with a smile on their faces."

'Tis the season to upgrade

Systems in use at retail chains and credit card companies are designed to handle heavy transaction loads

Carter Hawley Hale Information Systems	Two IBM 3081s, one 3084, one 3090 Model 200
Macy's California, Inc.	Two IBM 3083s
Visa U.S.A.	Three IBM 3090 Model 180s, two 3090 Model 150s, one 4381
Mastercard International	Two IBM 4381s, two 4341 mainframes
American Express Credit Corp.	One IBM 3090 Model 400, 3090 Model 200, 3084-QX, 3081, two 3083s

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CW CHART

Seasonal

FROM PAGE 1

you'll have to get manual authorization. Customers are going to get extremely frustrated."

An aim toward speedy customer service is the reason companies such as American Express Co. in New York have deployed more than 10,000 point-of-sale (POS) terminals at merchant sites this year. In 1986, only 200 were issued.

Santa's long list

The company's hybrid IBM Systems Network Architecture (SNA) and CCITT X.25 packet network for credit authorization will process more than 60 million transactions this year, the bulk of which will occur during the last four months of the year, said Al Crawford, senior vice-president of telecommunications at American Express. The firm is gearing up for as many as 140 million transactions in 1988.

The enhancements to its computer systems include a software upgrade that lets SNA communicate with the Transaction Processing Facility, a custom host operating system. "Last year, we faced a real bottleneck at this point. Now we should be able to process more smoothly," Crawford noted.

To make operations run smoothly for its subscribing merchants, American Express recently introduced computerized voice response on its credit card voice authorization network, designed for smaller merchants that do not use POS terminals.

When a merchant calls to verify a card, the operator switches the call to a computer that will automatically check its data base. The system uses software developed in-house with the cooperation of AT&T, Crawford said. The application, which uses an IBM System/88, has increased operators' productivity by as much as 40%.

To cut costs on its data network, American Express got rid of leased lines and now uses dial-up facilities instead. Coupled with software modifications on mainframe modems, response time is significantly improved.

Likewise, Macy's expects to report a 60% increase in response time this season, according to Darryl Yim, manager of network services. Shoppers will only have to wait a split second for the computer to approve their credit cards, Koloski added.

Busy sidewalks

To prepare for the onslaught of data feeding into the two IBM 3380 mainframes, Macy's purchased additional IBM 3380 disk drives in the spring. "The kind of volume we get during Christmas is mind-boggling," Koloski said.

After sizing up the growing amount of traffic, American Express also installed two extra IBM 3725 concentrators and upgraded its network host computers from an IBM 3081 to a new IBM 3090 Model 180. "We made a very careful traffic analysis to come up with this strategy," Crawford noted. "We hope to sail through the season."

Other credit card companies also admit the load is incredible."Until the mid-1980s, we were struggling just to keep up with the holiday volume from year to year," Visa U.S.A., Inc. Executive Vice-President Roger Peirce said in a prepared statement.

During the 1986 holiday season, Visa's data processing centers reported 99.98% availability, 24 hours a day. Thanks to the recent $16 million three-year upgrade on Visanet, a hybrid SNA and bisynchronous network, capacity worries can be buried with the past, noted Peirce, who stressed that credit verification and transaction clearing and settlement for banks are top priorities at Visa.

According to Scott Loftesness, senior vice-president of Visanet engineering, this year Visa replaced all the analog transmission lines between its San Mateo, Calif., and McLean, Va., offices with T1 trunks for higher performance.

Christmas in August

Mastercard International, Inc. in St. Louis will also experience its highest volumes. Paul Noblett, senior vice-president of general operations, said a doubling in traffic is normal this time of year. The distributed private packet network from BBN Communications Corp. has been expanded from seven to 13 sites, reducing overall expenses on data transmission.

Adequate planning time is necessary, MIS directors agreed. "If you don't finish your holiday planning by the end of the summer, then forget it," Crawford said. Early this past summer, Crawford's staff began collecting traffic statistics from the previous year's holiday season. In addition, it fine-tuned its engineering projects, which would carry American Express through this year.

Carter Hawley Hale's Menar said the season is well planned for. "By early October, we freeze all systems changes," he said. "The capacity is well planned across the board, so there is no room for speculation. We are not going to be worrying about Christmas processing."

Greene nixes Bells' designs on equipment

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — U.S. District Judge Harold H. Greene dealt the regional Bell holding companies another blow last week, ruling that they cannot be involved in the design of telecommunications and customer-premise equipment.

Greene, who oversees the Bell system divestiture agreement, said design is an integral part of manufacturing such equipment and, thus, is prohibited by the decree's ban on manufacturing. "If they could engage in design of telecommunications and customer-premise equipment, they would have the same incentive and ability to undermine competition as did the Bell system," Greene wrote in his opinion.

The ruling was prompted by a petition from AT&T and supporting memoranda from other equipment manufacturers seeking clarification on the boundaries of the manufacturing ban. The issue boiled down to whether prohibited manufacturing activities include only the fabrication of equipment — as the Bell companies contended — or the design and development of equipment as well.

Echoes of the past

Greene noted that virtually every manufacturing case discussed during the Bell system's antitrust trial involved the manipulation of product design and development to hurt competitors. Bell companies used their monopoly control over the local telephone network to design network interfaces that would discriminate against competing products, the government charged during the trial.

The Bell holding companies said they were disappointed by Greene's ruling. A spokesman for Southwestern Bell Corp. said the decision will reduce the number of products available in the marketplace and stifle innovation. Bell Atlantic Corp. said it will appeal the court decision.

Greene used his written opinion to criticize policies and statements of the Department of Justice and Dennis R. Patrick, chairman of the Federal Communications Commission.

The judge blasted the Justice Department for failing to take enforcement action two years after it received complaints about the Bell companies enaging in prohibited activities. Greene characterized an October speech by Patrick as an appeal for noncompliance with the decree.

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Mac pilgrims never looked back

First corporate customers weathered 'lonely days,' Apple fluctuations

BY CLINTON WILDER
CW STAFF

MONTVALE, N.J. — Dick Webb does not really care whether he is considered an MIS pioneer. He would rather be thought of as a man who simply made a smart decision for his company.

Webb, the partner in charge of technology at Peat, Marwick, Main & Co., ordered 2,700 Apple Computer, Inc. Macintosh computers on the Mac's introduction date in early 1984. Peat Marwick was the most prominent early corporate user of the Mac, and Webb did not need the current rush to board the Macintosh bandwagon to feel vindicated in his decision.

"It's nice to be thought of as a pioneer and taking the risks, but I never had any doubts about it doing what we wanted it to," Webb says. "We didn't view it as a risk. We felt we were dealing as objectively as we could."

Peat Marwick's Mac population has since boomed to nearly 8,000 worldwide, including 2,000 machines purchased in the 12 months ended Sept. 30. And when the Big Eight auditing firm merged with Amsterdam-based KMG Main Hurdman earlier this year, the Mac won out over KMG's Compaq Computer Corp. models as the worldwide standard for the merged firm's auditors.

'Got what we want'

Webb admits he had to battle corporate skepticism about the Mac at first, but those days are long gone. "Some clients questioned it, and our partners questioned it as well," he says. "But I think we were able to convince them we were getting out of it what we wanted."

For Peat Marwick, the biggest advantages of the machine are similar to what other corporate users have found: ease of use, lower training and support costs and something Webb says is often overlooked — reliability.

"We'd be throwing money away to take a service contract on them," he says. "And this is a computer that our auditors are carrying around a lot."

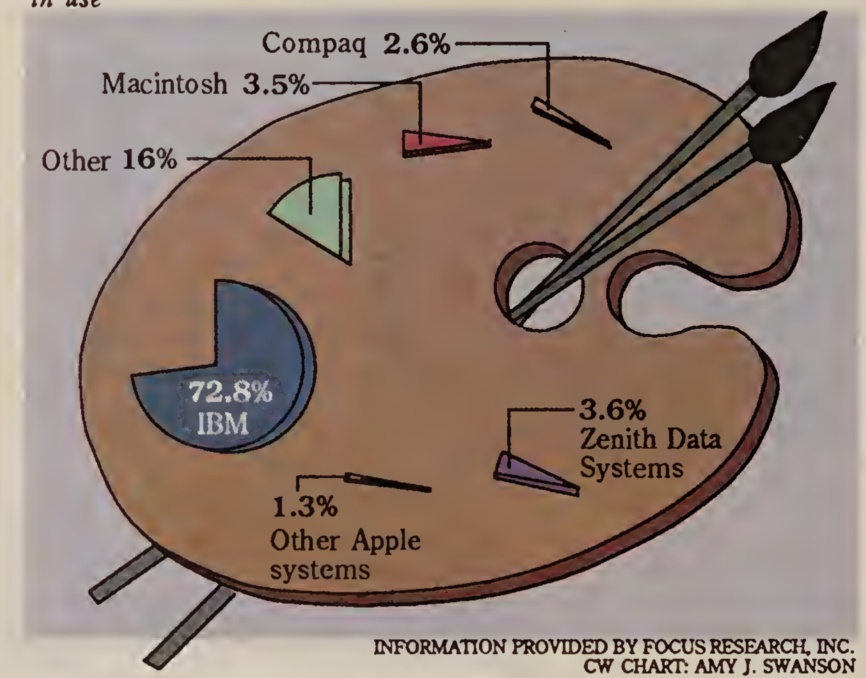
Peat Marwick has benefited from a very close relationship with Apple, one that began when Webb saw a prototype Apple Lisa computer in operation in late 1981. "We wanted a vendor to work closely with us, because we were planning something that no accounting firm had ever done," he says.

Webb says one of the biggest challenges of Mac use is to constantly push the limits of the computer's memory as Peat Marwick develops increasingly complex auditing software. The firm has upgraded most of its 128K-byte models to Macintosh Plus models and, essentially, no longer supports any remaining 128K-byte models. "We are continually challenging the capability of the machine," he says.

When Apple suffered losses, layoffs and Chairman John Sculley's controversial firing of cofounder Steve Jobs in 1985, Webb never really worried about the vendor's future, he says.

Color them blue

Survey of 12,200 sites with IBM or plug-compatible mainframes indicates Apple Macintosh systems account for only 3.5% of micros in use



INFORMATION PROVIDED BY FOCUS RESEARCH, INC.
CW CHART: AMY J. SWANSON

"I think it was good that we were 3,000 miles away," he says. "If I lived in Silicon Valley, it probably would have been more of a concern. But I thought [Jobs' departure] would be good for Apple."

At fellow Big Eight firm Arthur Young, another early Macintosh corporate user, there was more concern in 1985.

"Those were lonely days," recalls Rick Richardson, national director of technology development. "There was a legitimate question whether Apple was going to be around. But we felt we would dance with the one that brought us. The reasons for choosing their technology in the first place were still valid."

New York-based Arthur Young does not disclose the number of Macintoshes it uses, but, as at Peat Marwick, the Mac is the standard auditor's microcomputer. Richardson estimates that he has saved his firm $20 million in training costs, compared with what the cost would have been to train users in the Microsoft Corp.'s MS-DOS.

Richardson says he is pleased to see the Mac gaining acceptance in the corporate world, but admits the machine is not for everyone.

"It will never rival the software base for MS-DOS, but how many people need 50 word processing packages?" he asked.

DEC connection in expo limelight

BY JAMES A. MARTIN
CW STAFF

ANAHEIM, Calif. — More than 10,000 Digital Equipment Corp. users will converge here this week with their minds set on connecting to DEC, both literally and figuratively.

Among the concerns the users will bring to the Dexpo West '87 exhibition and Decus, the DEC Users Society conference being held concurrently, are the following:

- Third-party compatibility with DEC's proprietary VAXBI bus.
- Better connectivity between DEC machines and Apple Computer, Inc. Macintosh systems.
- How to communicate better with DEC on new product and upgrade announcements.
- What role optical disk technology will play for them.

Third-party compatibility with the VAXBI bus in DEC's VAX 8000 series is "a controversial subject," according to Dave Eulitt, a DEC market analyst for Computer Intelligence, a San Diego-based computer research firm. DEC has strictly limited the number of VAXBI bus licenses it has granted to third-party vendors, making it difficult for the market to develop and frustrating users, Eulitt said.

"Without third-party products that are able to access the BI bus, we won't look at the 8000 series seriously," said Ross Miller, a software developer and VAX user for On-Line Data Processing in Spokane, Wash. "We don't want to be dependent on DEC."

System Industries, Inc. in Milpitas, Calif., will announce in Anaheim next week that it has reverse-engineered the BI bus and will offer 8000 series compatibility as an option for its new Clustor intelligent disk controller products. "DEC doesn't hold a patent on the BI bus, and it's not certain they will get one. In the interim, we've reverse-engineered the bus, adding functionality and not just duplicating it," said Dan Post, a System Industries spokesman.

Integration hot item

Another hot topic this week is expected to be DEC-Macintosh integration. "We will be looking strongly at Mac integration products," said Kevin Oberman, network manager for Lawrence Livermore National Laboratory, a U.S. Department of Energy engineering contractor. The lab has some 200 Macintoshes that Oberman said he would like to link to his department's seven VAX systems.

"Most of our Macintoshes are just running terminal emulation," Oberman said. "We would love to see some kind of integration product comparable to DEC's PC network giving us reasonably transparent access to files and printers connected to a DEC network. DEC doesn't make anything like that [for the Macintosh], so it will have to come from a third party."

In software, users will be looking for more resource accounting and performance monitoring systems for DEC Vaxclusters. "As systems are clustered together more often, a system manager is in charge of four VAXs where he once had one or two, so it will be harder to manage those resources," Computer Intelligence's Eulitt said. "As a result, packages that allow managers to more effectively monitor and manage resources will become more popular." The optical disk drive market is beginning to gain momentum, and DEC is expected to announce at Decus its plans for a write-once read-many 12-in. disk with 1G byte of storage per side and compatibility with the firm's VAXBI bus, Unibus and Q-bus architectures (see stories page S8).

"This will really set the optical disk market off when DEC gets into it," Eulitt said. Most third-party vendors have been awaiting DEC's move into the market.

DEC-compatible machines wheeled in by the truckload

ANAHEIM, Calif. — Digital Equipment Corp.-compatible vendors will be unveiling a flurry of software and hardware products at the Dexpo West '87 conference here this week.

Among the planned announcements are the following:

- Oracle Corp. and Wordperfect Corp. will unveil a software interface in which Wordperfect Version 4.2 for the DEC VAX, which will also be announced at the show, can query local and remote Oracle data bases and incorporate the data into a Wordperfect document. The interface will be commercially available during first-quarter 1988 without charge for the VAX/VMS operating system.

Wordperfect 4.2 for the VAX reportedly includes the capability to transfer documents between Wordperfect systems on the VAX, IBM Personal Computers and the Apple Computer, Inc. Macintosh. Wordperfect will also unveil Wordperfect Office, an office automation package for the VAX/VMS. Both packages will be available next month from $1,000 on the Vaxstation to $29,000 for the high-end VAX 8978.

- Alisa Systems, Inc. will introduce Sequelink, a networking software program to connect Macintosh applications to the Oracle data base on VAX systems. Sequelink reportedly uses standard SQL to enable Mac programs to remotely query, update, create and manage Oracle data base tables on the VAX.
- System Industries, Inc. will announce Clustor, a family of data-storage systems that can be configured with up to 16 disk drives and offer multiprocessor connectivity with up to eight VAX systems. The Clustor products are said to feature cache processing, performance monitoring, removable Winchester disk drive chassis, simultaneous data transfers and command queing. I/O functions are handled by onboard processors rather than the system CPU, the company said, increasing throughput and performance. The first Clustor products will be available in March. Pricing was not announced.

In addition, System Industries is expected to report that is finalizing development of an independent interface to DEC's VAXBI bus. The VAXBI-compatible Computer Port Adapter is scheduled for availability as an option on Clustor and other products in late 1988.

Macintosh finds a niche in VAX market

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — While Apple Computer, Inc.'s long flirtation with Digital Equipment Corp. may not result in any formal relationship, it has given Apple a foothold in major corporations.

Between 20% and 30% of all microcomputers installed near DEC VAXs are Apple Macintoshes, according to Stamford, Conn.-based Gartner Group, Inc. Users said the Mac is filling a gap between DEC's terminal offerings and its high-end workstations, providing them with more capabilities than the terminal at a price significantly less than that of a workstation.

Alan Foonberg, a technical staffer at Aerospace Corp., a nonprofit organization that does systems integration consulting for the U.S. Air Force and other public agencies, said the Mac-to-VAX connection is a natural. Although DEC terminals offer low-cost access to the VAX, they cannot run personal productivity software packages. Relatively few general-purpose computing programs are available for DEC's workstations, and their prices are significantly higher than the Mac's.

"Some people want to use Macintoshes because they want to do more," Foonberg explained, noting that Macintoshes are used for technical applications as well as for creating spreadsheets and charts. "Why have two things on your desk?"

Kindred spirits

Apple sees VAX and Mac users as having similar characteristics and aims to take advantage of that link, according to Charles Berger, vice-president of market development at Apple. "If we see a VAX [in a user site], we go after it," he said. "If they're willing to accept a non-IBM solution in the minicomputer world, then they'll probably accept it in the micro world."

"DEC doesn't have a strong PC product," said Jeff Ehrlich, manager of product technology at General Electric Co. "Apple doesn't have a mini to be a backbone for large networks of Macintoshes. A mini is necessary for very large storage requirements and more intensive computing."

A number of GE's subsidiaries are looking to connect Macintoshes to VAXs. Ehrlich said GE representatives will attend the Dexpo East show in February to investigate third-party products facilitating the Mac-to-VAX connection. "There are so many," he said. "The problem is choosing between them."

Arthur Young is also investigating a Mac-DEC connection, according to Rick Richardson, national director of technology development at the Wall Street firm. Richardson said Arthur Young is considering buying a VAX to function as a server for its Macintoshes.

"There are going to be tasks that we can't perform on a micro level," he explained. "We have a need to create larger data bases."

A whole industry has arisen from the Mac-DEC liaison. At Dexpo East, Apple and its third-party developers are expected to account for one-quarter of the floor space.

Third-party developers said Apple and DEC have supported their activities, especially during the last year. "We got our compasses pointing in that direction two years ago," said Robert Denny, president of Alisa Systems, Inc., a Pasadena, Calif.-based developer of communications tools allowing Mac-to-VAX links. "At that time, Apple was preoccupied with the IBM world. Since then, they've realized that [DEC is] ripe; it's the second biggest opportunity out there."

Among the most significant products in the Mac-to-VAX world has been Odesta Corp.'s Helix VMX, a product introduced last fall that allows the Mac to retain its graphical user interface when connected to a VAX.

Although rumors of a formal hookup between Apple and DEC have run rampant during the last year, Apple's Berger denied that any arrangement exists between the two companies. Instead, he said, it has been a matter of both companies' recognizing a synergy and Apple's ability to capitalize on it.

"We frequently find ourselves in the same place," Berger explained, noting that both Apple and DEC have been strong in the scientific and engineering marketplace. Additionally, communications between the VAX and the Mac are simpler than those between the Mac and an IBM mainframe, he said.

DEC's dismal showing in the PC market has also worked to Apple's advantage. Although DEC has attempted a number of PC offerings, none has caught on.

"I don't think the PC market has been where their heart is," GE's Ehrlich said. "They probably figure it's better to do nothing than to come out with another compatible.

Although it appears a formal reconigition of the DEC-Apple link is not imminent, the relationship will continue to grow, according to industry observers.

"It'll probably just cook along as an informal relationship," said Bob Randolph, an industry analyst at International Data Corp. "It appeals to the maverick breed — the not-dyed-in-the-wool IBMer."

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DEC lures PC users to VAX

Decnet-VAX grouped with VAX/VMS Services for MS-DOS

BY ED SCANNELL
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. amended its licensing policies last week to allow Decnet-VAX licenses to be bundled with VAX/VMS Services for MS-DOS, making VAX computers licensed microcomputer servers.

The company said the decision to bundle the VAX/VMS services was based on the realization that DEC customers have a growing need to more fully integrate microcomputers with their larger systems.

The new license allows Decnet-VAX users, of which DEC said there are 88,000, to save a "substantial" amount of money compared with previous licensing policies. For instance, customers who used a Microvax as a server and wanted VAX/VMS services previously had to pay $4,000. With the relicensing of those services into Decnet, the price is approximately $1,000. Users of the company's 8800 series previously had to pay approximately $19,000 for VAX/VMS licenses compared with $17,000 under the new license, according to Joyce Radnor, who is a DEC spokeswoman.

"We can establish an environment where PCs really function as a peer to any processor in a network," said George Symula, manager of DEC's PC Integration Office Program. "Every processor on the network can be a server, share information at the record level and access any VAX storage device."

Symula said he believes this approach is more effective than those offered by most local-area networks because the VAX sacrifices none of its abilities to run VAX/VMS applications while also acting as a file server for microcomputers. "In most PC LANs, a dedicated server box does nothing but serve the PC," he said.

DEC also announced PC Integration Packages for its Microvax II and Microvax 2000 — a series of existing networking programs packaged together — and told of its intent to support IBM's Micro Channel architecture.

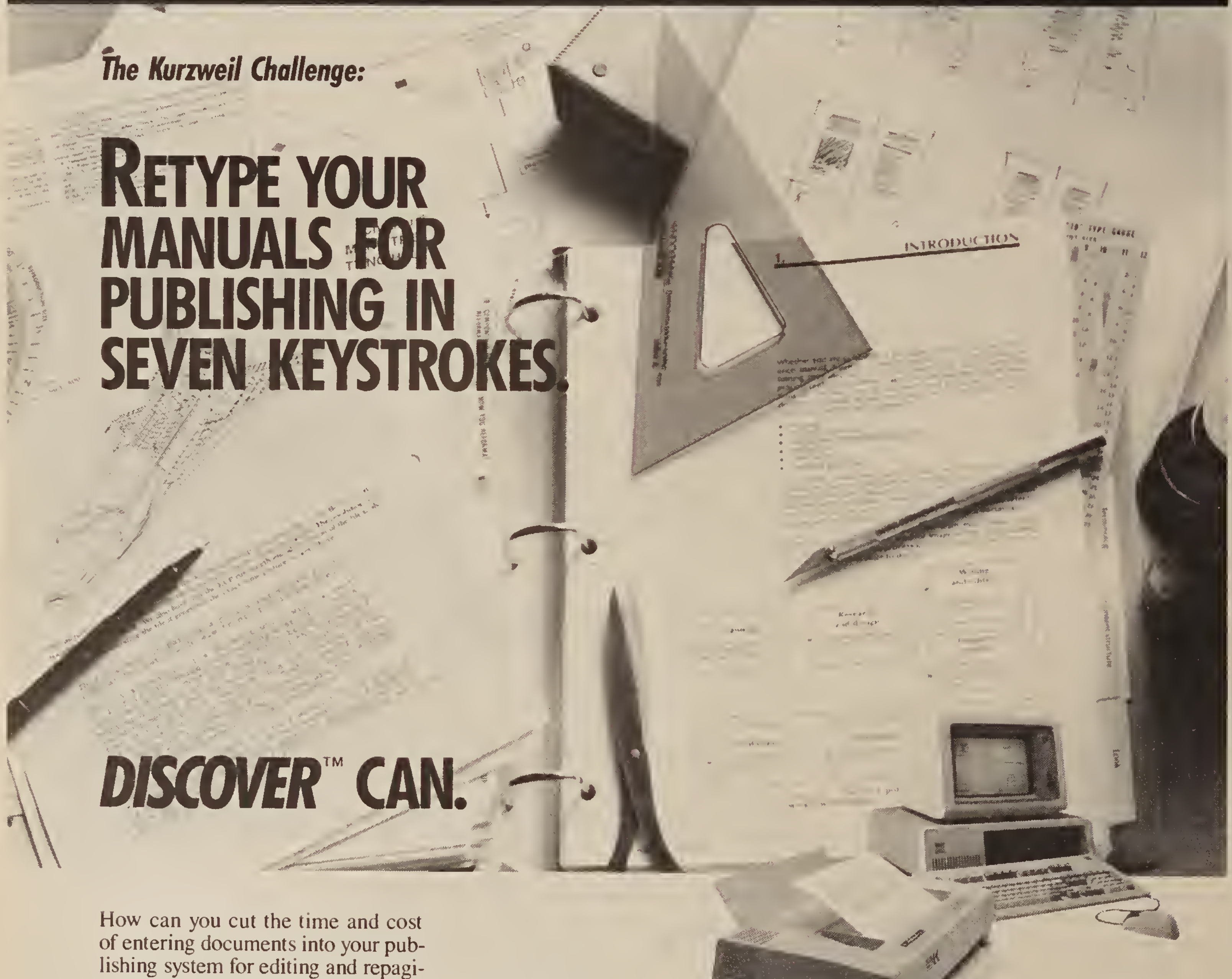
The Microvax II version of the integration packages includes an IBM PC Network integration package complete with MS-Windows, a keyboard and a mouse; two IBM PC Network services packages; and a Decnet-VAX license. The Microvax 2000 package features a thin-wire Ethernet adapter an IBM PC Network services package and a Decnet-VAX license.

Both integration packages are priced at $3,000 and are available immediately.

DEC will support the Micro Channel through a series of hardware and software boards that it will integrate into its systems, Symula said. "Then we'll layer all our stuff, like Decnet, DOS services and applications on top of that," he said.

Symula declined to say when such products would be available.

XEROX



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Dbase firms ask IEEE help on standards push

BY DOUGLAS BARNEY
CW STAFF

The raging dispute between Ashton-Tate Corp. and firms that depend on the Dbase market has escalated with a committee of Ashton-Tate competitors attempting to get the backing of the Institute of Electrical and Electronics Engineers, Inc. (IEEE) in a quest for an American National Standards Institute (ANSI) standard Dbase language definition.

The Dbase Standards Committee, a group of Dbase compiler and programming tools vendors, is still operating without the consent of Ashton-Tate, the original developer of Dbase. Ashton-Tate Chairman Edward M. Esber Jr. has publicly declared that his firm is willing to take legal action to protect Dbase.

"This doesn't change anything. It just sort of fans the flames a little bit," said Geoff Berkin, corporate counsel for Ashton-Tate.

According to Marty Rinehart, chairman of the Standards Committee, two individuals affiliated with the IEEE contacted the committee and briefed members on the procedures for proposing a standard. But Andy Salem, director of standards for the IEEE in New York, said he was unaware of the issue as of press time last week. Even if a proposal is formally made, it will not necessarily be adopted by the IEEE, Salem cautioned. "There is no guarantee that it will happen," he said.

The IEEE, a member of ANSI, defines standards that may subsequently be adopted by ANSI, Salem explained.

Ashton-Tate opposes the efforts of the committee to define a standard for a product the firm developed and will continue to enhance. "We are coming out with another version of Dbase with a number of differences. I am not sure how a standard is supposed to operate in that context," Berkin said. "What the Standards Committee is saying is, 'Ashton-Tate, you have a bundle of proprietary rights, and we are going to try to strip some of those away from you.' We interpret that as a threat to our business."

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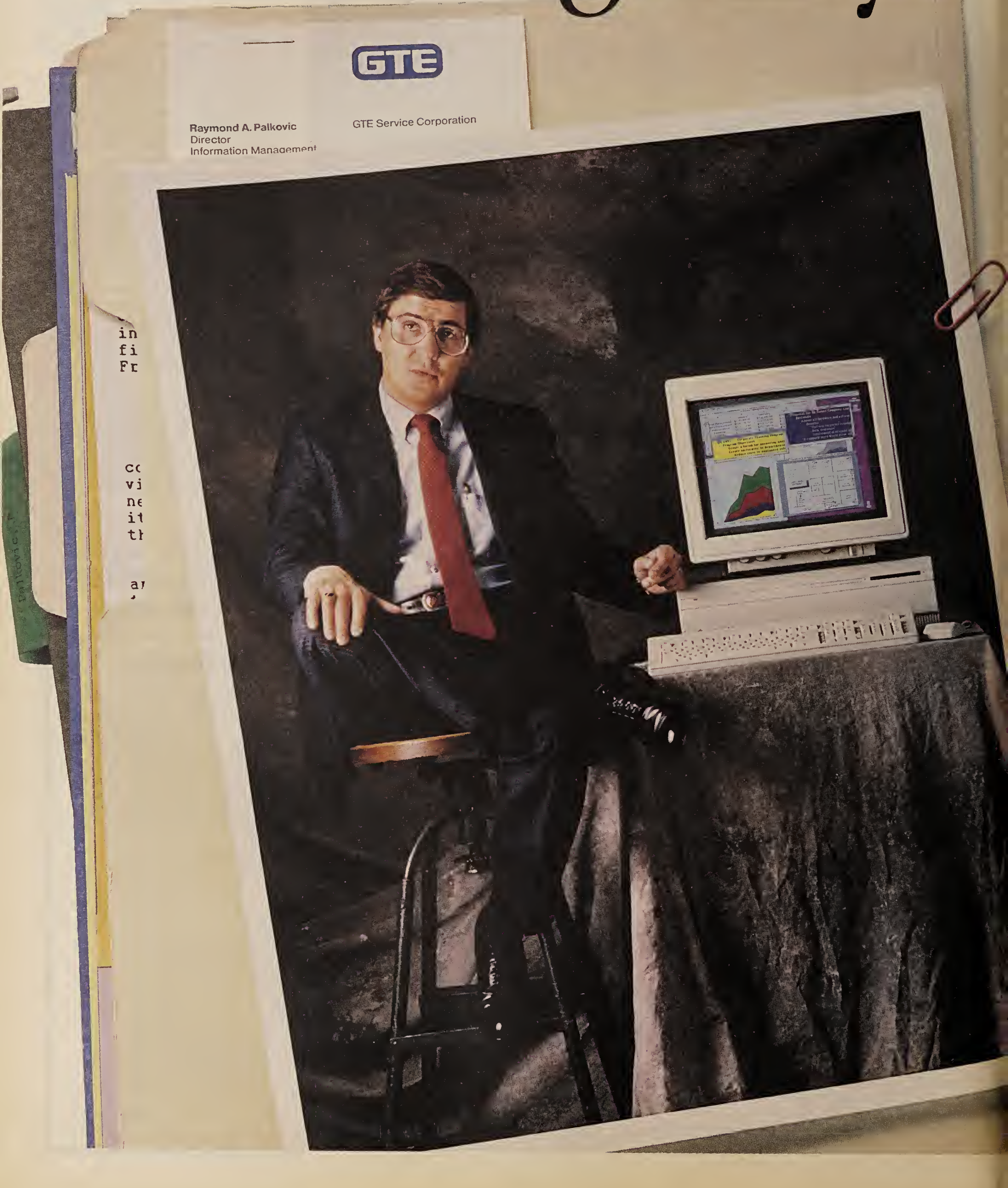

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IBM 9370 seen in need of usable tools

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — IBM's 9370 is off to a somewhat shaky start because of relatively slow U.S. shipments, insufficient support of personal computer communications and a wait for critical networking software, industry analysts told a group of Chicago MIS executives last week.

Speaking at a forum on IBM 9370 use sponsored by Bell Atlantic Systems Leasing, the analysts estimated that about 2,000 systems will have been shipped by year's end in the U.S.

"IBM won't make their goal of selling 4,000 to 5,000 systems this year," said Myron Kerstetter, director of the Small Systems Service at the Gartner Group, Inc. in Stamford, Conn.

Many machines are being shipped for evaluation in pilot projects at large corporate sites, Kerstetter said, while next year is expected to bring high-volume shipments.

This year, some 9370s have even been offered with a six-month deferral of payment so that they would be installed in 1987, Kerstetter said.

The 9370 is doing much better in Europe, said Bob Djurdjevic, president of Annex Research in Phoenix. "We're just seeing the tip of the iceberg in the U.S. because IBM wants to spread the early 9370s around as development machines," Djurdjevic said. "The system still lacks a lot of applications software, and users here are only beginning to develop applications for the IBM 9370s they will order next year."

Current 9370 users, Kerstetter said, fall into three categories: those who replaced IBM 4331s and 4361s, those who are running 9370 evaluation projects and those who are developing new applications for the 9370, in some cases guided by a team marketing approach from IBM.

"IBM is sitting down at the table with representatives of more than 200 of the largest MIS organizations," Kerstetter said, "and talking about the requirements for critical applications and why the 9370 may not today be exactly the right machine for some jobs."

Users should expect a number of 9370 product changes next year, Kerstetter predicted, including the following:

- A major enhancement of the 9370 Model 60 through a board-level CMOS upgrade. The new boards would replace the bipolar transistor-to-transistor logic chips that have been used in Models 20, 40 and 60 since the 9370's 1986 announcement.
- Price reductions of 10% to 15% on current 9370 models in the first half of the year.

The 9370 is a highly efficient Systems Network Architecture network node, analysts said, but it is far less effective at communicating with PCs — a drawback in its role as a distributed processor. One of the most glaring gaps in 9370 software, they said, is the lack of support for the IBM Netbios PC communications protocol.

"The real problem in using the 9370 in a local-area network is that it does not support the Netbios protocols, while file servers from 3Com, Novell and Banyan Systems do," said L. David Passmore, a principal at Network Strategies, Inc. in Fairfax, Va. "As a result, the 9370 doesn't talk to PCs very effectively."

CASE tool turns out 'skeletal' Cobol

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — A software combination available from Index Technology Corp. and Micro Focus, Inc. allows users of Index's Excelerator systems analysis and design software to automatically create structured "skeletal" Cobol source code.

Although the product does not fully bridge the gap between computer-aided software engineering tools and actual source code, it does provide an outline from which programmers can work, said Mike McCandless, vice-president of marketing planning and programs for Micro Focus.

The product, announced last week, consists of two elements: the $650 XL/Interface Micro Focus from Index and the $500 Excelerator Interface from Micro Focus. The Cobol used is Micro Focus's VS Cobol Workbench.

An early user said he has found the system to be effective but not a replacement for coding by hand.

"It is still a skeleton program. You have to go back and put your detailed edits and detailed processing logic into the program. But the key is that the transition from an analyst's concept to a skeleton program is now automated," explained Chuck Cole, a general partner with the C-4 Group, who was a beta tester for the product while working as a systems consultant with Transamerica Corp. "It is a time saver, plus it allows us to control program structure without having to review code."

Cole used the package to develop a human resources management system for Transamerica.

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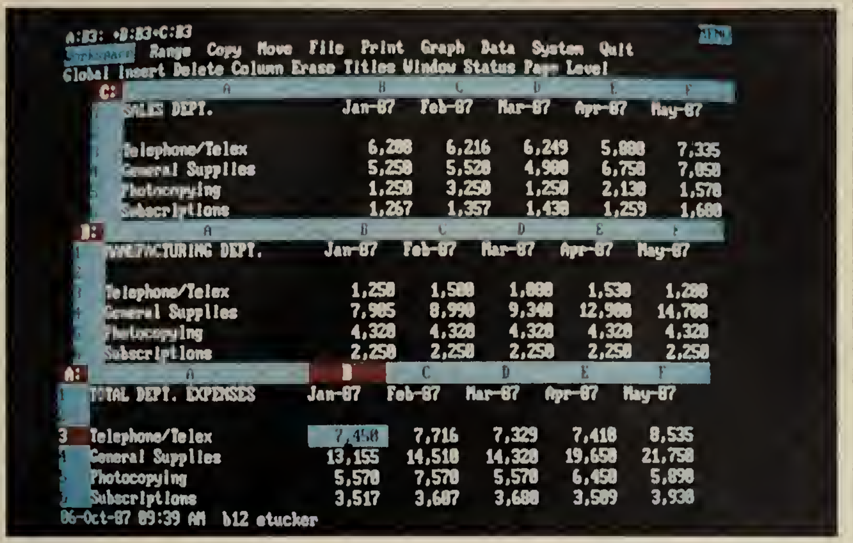

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A:B3: +B:B3+C:B3
Worksheet Range Copy Move File Print Graph Data System Quit
Global Insert Delete Column Erase Titles Window Status Page Level
C:  A                          B       C       D       E       F
    SALES DEPT.           Jan-87  Feb-87  Mar-87  Apr-87  May-87

    Telephone/Telex        6,200   6,216   6,249   5,800   7,335
    General Supplies       5,250   5,520   4,900   6,750   7,050
    Photocopying           1,250   3,250   1,250   2,130   1,570
    Subscriptions          1,267   1,357   1,430   1,259   1,600
B:  A                      B       C       D       E       F
    MANUFACTURING DEPT.  Jan-87  Feb-87  Mar-87  Apr-87  May-87

    Telephone/Telex        1,250   1,500   1,000   1,530   1,200
    General Supplies       7,905   8,990   9,340  12,900  14,700
    Photocopying           4,320   4,320   4,320   4,320   4,320
    Subscriptions          2,250   2,250   2,250   2,250   2,250
A:  A                      B       C       D       E       F
  1 TOTAL DEPT. EXPENSES  Jan-87  Feb-87  Mar-87  Apr-87  May-87

  3 Telephone/Telex        7,450   7,716   7,329   7,410   8,535
  4 General Supplies      13,155  14,510  14,320  19,650  21,750
    Photocopying           5,570   7,570   5,570   6,450   5,890
    Subscriptions          3,517   3,607   3,680   3,509   3,930
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Lotus last week showed *1-2-3 Release 3 to the Boston Computer Society. Above is a currently unavailable 3-D spreadsheet.*

simplified interface designed for less knowledgeable users, a source close to the effort said.

A key part of the interface is Lotus's 1-2-3. Lotus/DBMS will allow users to query the SQL engine from within a 1-2-3 work sheet. "It is a goal to let spreadsheet users get at shared work group data base data," said David Gilmour, general manager of the Advanced Products Division of Lotus's Software Products Group. "What Lotus/DBMS is all about is a set of graphics tools in the OS/2 Presentation Manager world that are designed to work tightly with 1-2-3/G as a user interface."

The connectivity to DB2 may be achieved by licensing SQLnet, an IBM Advanced Program-to-Program Communications (APPC)-based product from Gupta. SQLnet is currently being enhanced to work transparently with a variety of host data bases, including IBM's SQL/DS, Relational Technology, Inc.'s Ingres and Oracle Corp.'s Oracle. Lotus has never publicly acknowledged the Gupta relationship.

Access by TAC

Access to other data bases may also be possible through The Application Connection (TAC), a Lotus product that can query DB2, Information Builders, Inc.'s Focus, SAS Institute, Inc.'s SAS and On-Line Software International, Inc.'s Ramis. TAC is a more flexible and much more expensive connectivity product than SQLnet and is more oriented toward data retrieval than SQLnet is. Gilmour said Lotus will make future announcements that specifically define the relationship between TAC and Lotus/DBMS.

The first link is expected to be to DB2. "A Lotus link to DB2 would be extremely valuable, especially using SQLnet or a similar product using APPC," said Rich Finkelstein, vice-president of Codd and Date Consulting Group's central region.

While the DB2 connection, which is already a part of the Gupta product, may not be a part of the initial Lotus product, it will be delivered in a timely fashion, according to Gilmour. "Connections to alternative data base engines require that some details get worked out in the software. But a fundamental product goal is one user interface that can act against multiple data base engines," Gilmour said.

Lotus reportedly will position its Lotus Extended Application Facility (LEAF) as the primary development language for both 1-2-3 and Lotus/DBMS. Despite the success of the 1-2-3 macro language, Lotus may have a tough time convincing C and Cobol programmers to pick up an entirely new language.

Most SQL-based data bases, including IBM's OS/2 Extended Edition Data Manager, support more conventional languages. "There is no chance of a proprietary language ever becoming any kind of standard," Finkelstein said. "No one is going to spend the time to learn it, especially in this environment."

Gilmour defended LEAF as the primary applications development language. "Its strength is its connection to the Lotus products that support it," he said. "It ties 1-2-3 and the DBMS even more tightly together." He hinted at forthcoming and "exciting" nonprocedural applications development and querying tools but declined to go into specifics.

"Lotus/DBMS will be useful both as an interactive decision-support kind of tool as well as a basis for applications development in connection with the LEAF facility," he said.

Competition imminent

Lotus will not be without competition. Microsoft is expected to enter the market with SQL server technology licensed from Sybase, Inc. IBM plans to offer the OS/2 Extended Edition Data Manager. Ashton-Tate has announced intentions to deliver an SQL-based server product and has negotiated with a variety of vendors to acquire such a product. In addition, more traditional large-system vendors such as Applied Data Research, Inc., Oracle, Relational Technology and Informix Software, Inc. are also moving into PC territory.

The Microsoft strategy, while still unannounced, is becoming clearer. "Microsoft will use a really nice nonprocedural front end and turn Basic into a full language for first-time users and developers as their micro procedural language. And they will support C and Cobol for those developers who need it," a source close to Microsoft said.

Lotus/DBMS is part of an overall Lotus effort to expand into the MIS/DP marketplace. Other elements include TAC, 1-2-3/M and rumored Digital Equipment Corp. VAX and workstation versions of 1-2-3.

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Ada-based DBMS gets IBM approval

BY MITCH BETTS
CW STAFF

The Ada programming language will take another step into the commercial sector next week when a version of the Relate/DB data base management system, which is written in Ada, is unveiled for IBM's 9370 and 4381 systems.

CRI, Inc. in Santa Clara, Calif., a pioneer in the development of Ada software products for commercial applications, is expected to make the announcement Tuesday during the Ada Expo in Boston.

CRI will also announce its participation in IBM's Marketing Assistance Program, according to Paul Fuller, CRI's vice-president of marketing and sales.

Embraceable you

"This means IBM has embraced Ada into its third-party software program," a move that helps legitimize the use of Ada in the commercial sector, Fuller said.

Relate/DB is an integrated package of tools that includes a relational DBMS, a screen-based application builder, a report writer and a host-language interface. The IBM VM/IS version will range in price from $45,000 to $90,000, depending on the hardware, and will be available in the first quarter of 1988.

The fact that Relate/DB is written in Ada is of little importance to MIS managers, Fuller said, since the product also supports Cobol, Fortran, C and Pascal. However, he said, the Ada source code and a special "onion-skin layer" interface make the product highly portable among different hardware platforms.

For example, Fuller said, the applications software and the data base can be moved from a Digital Equipment Corp. VAX to a 9370 by changing only six lines of code. He said the reason CRI decided in 1983 to use Ada was because the language is easily ported to different hardware platforms and easily maintained.

Relate/DB is also available for Data General Corp. and Hewlett-Packard Co. minicomputers, Apollo Computer, Inc. workstations and microcomputers based on Intel Corp.'s 80286 and 80386 processors, CRI said.

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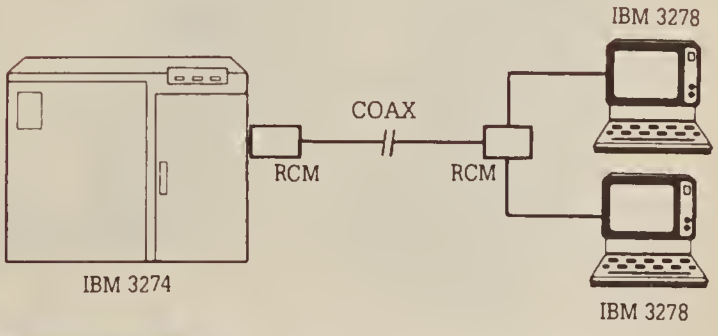

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Uccel

CONTINUED FROM PAGE 1

support system, will also join the banking lineup. Strategem, which was also acquired by Computer Associates, will become the Enterprise Management System (EMS). Uccel had wanted to bring the product to market after Infoloans. Computer Associates would not fix a price or availability date for the Strategem module.

- Graphics capabilities will be added to most of the banking applications for a fee of between about $11,000 and $25,000. The technology is based on products developed by Issco, which Computer Associates acquired in December 1986.

> "I'LL HAVE no concern if [Computer Associates] makes changes, as long as they are moving forward."
>
> LOWELL SWEET
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- Support and services will be improved, starting with a series of microcomputer-based training tools.

Despite Computer Associates' ambitious plans, users contacted last week were generally unimpressed with the software giant's intentions. While some said they would welcome improvements to the product line, others said they were skeptical that the vendor would follow through with the improvements.

"My perspective is, the jury is still out," said Robert Payne, manager of the Information Services department at Sooner Federal Savings and Loan in Tulsa, Okla. "Changes are nice to talk about, but I'm not sure. Remember, I bought Infoloans."

"We wouldn't invest this kind of time and start cross-integrating our people if we weren't very serious about this," Computer Associates' Wasilko said.

Some users expressed little interest in Computer Associates' activity. "It's not to say that Uccel stagnated, but I'll have no concern if [Computer Associates] makes changes, as long as they are moving forward," said Lowell Sweet, assistant vice-president of Internal Bank Systems at South Carolina National Bank in Columbia, S.C.

Another user expressed concern about the plans. Alton Blackburn, applications programming manager at The First National Bank of Florence in Florence, Ala., said his facility has written companion programs to the banking products, which could face rewrites if Computer Associates' changes are significant.

"I feel that they may mess with things too much," Blackburn said. "I keep hearing rumors about major rewrites going on in Florida," where much of the banking software development work is done.

First on the list of changes is Infoloans. Uccel had attempted to provide a fully integrated system to handle all the different types of loans a financial institution provides. Typically, automated banks rely on individual applications for commercial, mortgage and personal loans.

Bringing them together turned out to be too mammoth a task for the company to meet its initial shipment date of March 1987, a fact that emerged when Infoloans went out for early testing at the end of 1986.

A review of problems showed the product would not be ready until almost two years from the original date.

Computer Associates has scrapped this approach, Wasilko said. "Rather than attempt to deliver one absolutely finished system, we look toward a more staged development cycle," he said.

Infoloans will be released bit by bit, with the initial release being "very usable" and subsequent releases improving on the basic package, he said.

A common front end

The Masterpiece host environment will serve as a front end to the loans system, supplying users with common screens and access methods for all loan activity.

The plans for Masterpiece go beyond Infoloans, though. Wasilko said that over time, Masterhost will become "the foundation for all banking products." This effort, for which the company provided no timetable, would eventually provide a common user interface for whatever banking application a customer was using.

Wasilko described Masterpiece as being a layer added to both Infoloans and the other products. As a result, he said, it will not change the products to the extent that earlier releases would not be compatible.

A separate development effort is under way for the EMS decision-support product for banking operations. EMS was reportedly under development at Uccel and was intended to debut after Infoloans. It had been discussed at about the same time that Infoloans was introduced, but little was said about it thereafter.

Computer Associates, however, intends to revive EMS. The company will tie the product to two of its banking applications: the Financial Control System, a general ledger offering; and Profitability Manager, a profit-tracking application. This approach is a scaled-down version of Uccel's plan for EMS, which involved linking the package to many Uccel applications and to other vendors' products.

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Pansophic to add Telon version for System/38

BY JEAN S. BOZMAN
CW STAFF

OAK BROOK, Ill. — Pansophic Systems, Inc. will soon announce a new version of its mainstay Telon application generator for the IBM System/38, *Computerworld* learned last week.

The product, called Telon 38, was designed to work with two other Pansophic products, the Fusion 38 information retrieval and report writer and the PM 38 application package, which includes manufacturing, distribution and financial applications. The price for the system is $42,000 for one copy; multiple-copy discounts will be available, sources at Pansophic said.

"Telon 38 is going to be a very important product for us," said Robert Fortelka, vice-president of Pansophic's productivity products division. "It will be a complete application system that can be used to quickly design and implement new applications while maintaining high quality control of the project."

The product was not ported from the mainframe version of Telon, Fortelka said. Rather, it was written expressly for the System/38 by British firm Synon, Ltd.

"They've taken the methodology and the application development architecture of Telon and created something with the same look and feel as mainframe-based Telon," Fortelka explained. He said Telon 38 was acquired through a joint marketing agreement between Pansophic and Synon that was finalized in recent weeks.

By popular demand

Pansophic, which offers many System/38 products through its Applications Products and Graphics Divisions, is marketing Telon 38 in part to meet user demands for a System/38 applications generator.

Telon 38 was designed with several user-friendly features, including natural-language statements. Among the product's several modules are an applications generator, a menu designer, a layout designer, a system manager and a documentation program.

A statement issued to the Pansophic sales force last week confirmed Pansophic's drive toward departmental processing. "Telon 38 provides Pansophic a continuation of its strategy to move its mainframe products across mid-frame and personal computer machines," the statement said. "Integration between Telon 38, Fusion [and our] manufacturing, distribution and financial applications data bases is being designed and further information will be forthcoming."

As of last week, Telon 38 was being installed at a few alpha sites within Pansophic. The firm said the product will be announced to Pansophic customers this week in a letter. A formal announcement is slated for January. General availability is also scheduled for next month.

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Wang lets VS, Unix run together

Will also resell Informix tools; seen shifting from proprietary systems

BY ROSEMARY HAMILTON
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. plans to offer a virtual machine version of its VS operating system that would allow multiple versions of Unix and VS to run concurrently.

VS/VM, which is based on a concept similar to IBM's VM operating system, was introduced last week along with an updated version of Wang's Unix offering. Meanwhile, Wang also announced a deal with Informix Software, Inc. to resell the Informix relational data base management system and development tools, which run under the Unix operating system.

Wang is "recognizing that there isn't a lot of room for proprietary operating systems in the future," said Peter Burris, an analyst with International Data Corp. in Framingham, Mass.

Unlike VM, the Wang virtual machine implementation does not have the ability to directly support applications. It was designed strictly to act as a hypervisor to a multiple operating systems environment.

A generous host

The general virtual machine concept allows the operating system to emulate the total operating system environment to its guests, whether they are other operating systems or users. As a result, each operating system "thinks" it has the whole system to itself and schedules jobs and accesses resources in this "virtual" environment.

In reality, the operating systems are sharing resources such as memory and I/O devices. As VM expert Tom Foth said, "It's all done with mirrors."

With this setup, Wang users would be able to run Unix-based and VS applications on the same system. Another option would be to run different versions of the VS operating system on one CPU.

This option could be particularly useful during an operating system upgrade.

One VS/VM beta-test site has been using the operating system to support a VS production environment and a VS development system on one CPU. "This is a quality product that we've had a need for for some time," said Steve Waldman, manager of technical services at DWG Corp., a holding company in Miami Beach.

In September, Waldman's facility installed VS/VM on a Wang VS 300. While there have been a few minor glitches that "you anticipate as a beta site," there have been no "outstanding issues" with the operating system, he said.

The data center had been maintaining a production environment on one VS 300 and a development environment on a second.

This setup, however, had its problems, because the data center found it had more production work than one CPU could handle but that there was not enough development work to require its own CPU.

> WANG IS "recognizing that there isn't a lot of room for proprietary operating systems in the future."
>
> PETER BURRIS
> INTERNATIONAL DATA CORP.

With the virtual machine implementation, the data center can run additional production applications on the same system on which the development work resides.

Marty Gruhn, vice-president of The Sierra Group in Tempe, Ariz., said the VS/VM offering could benefit many Wang users. "If this works, then it's significant," Gruhn said. "This VM would allow users to run different software on one machine, and that could save a ton of money."

Gruhn cautioned users that the configuration with VS/VM and guest operating systems may "eat up lots of system resources."

A Wang spokesman said that in tests, the virtual machine component used 10% of the resources.

However, DWG's Waldman said his experience shows VS/VM takes up between 10% and 15% of the resources.

VS/VM will be offered for the company's VS 7000 series and the earlier VS 85 and VS 100 models. Licenses will range in price from $9,000 to $18,000.

The Unix offering will run on most Wang hardware, including the VS 7000s and such low-end models as the VS E series. It will range in price from $5,000 to $35,000, depending on the number of users it supports.

Both operating systems are available now.

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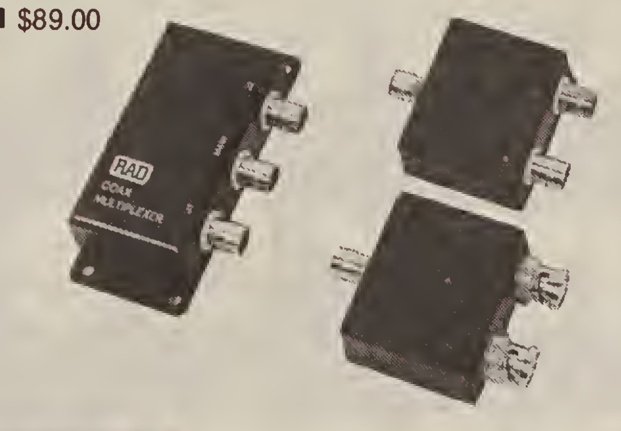

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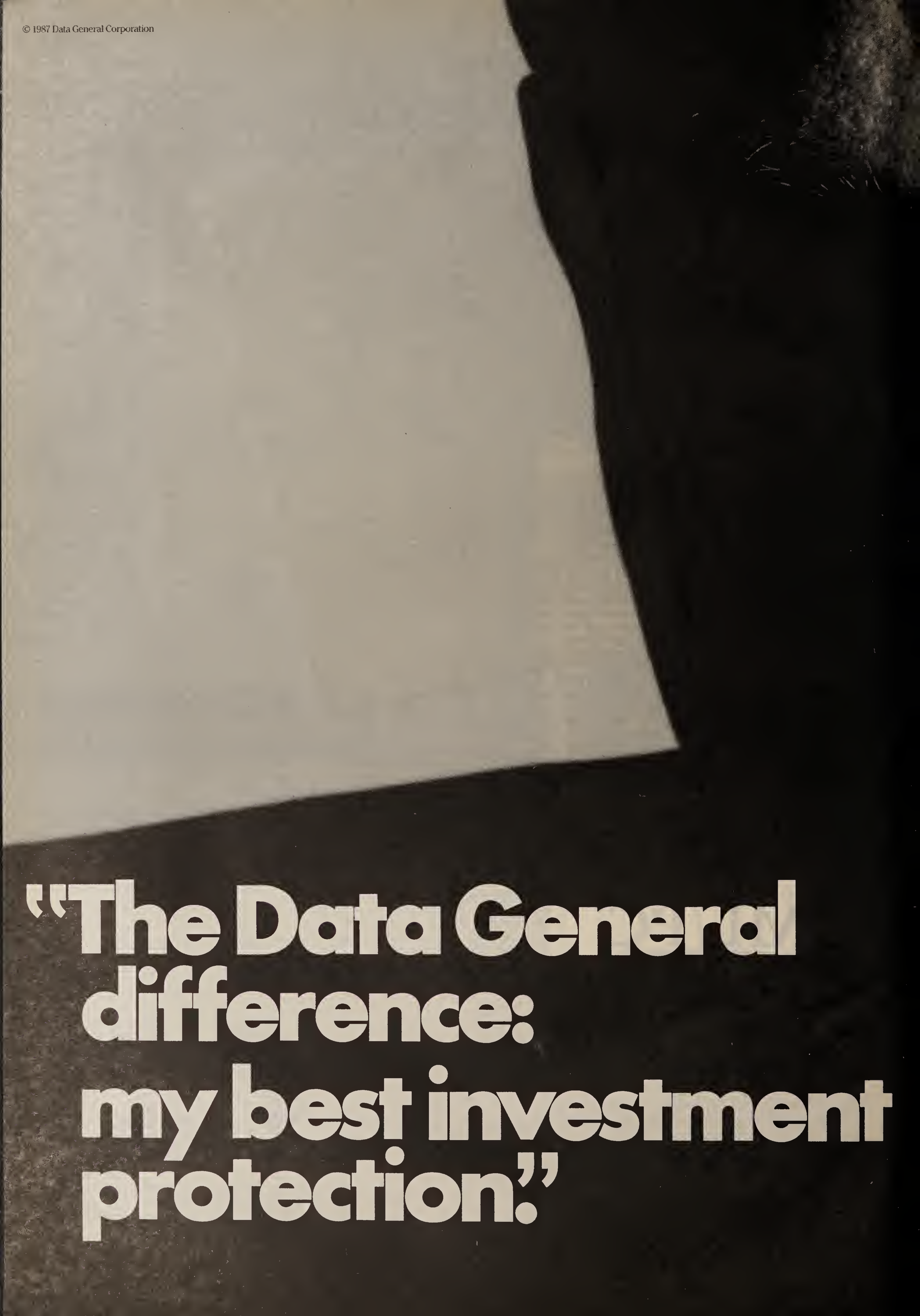

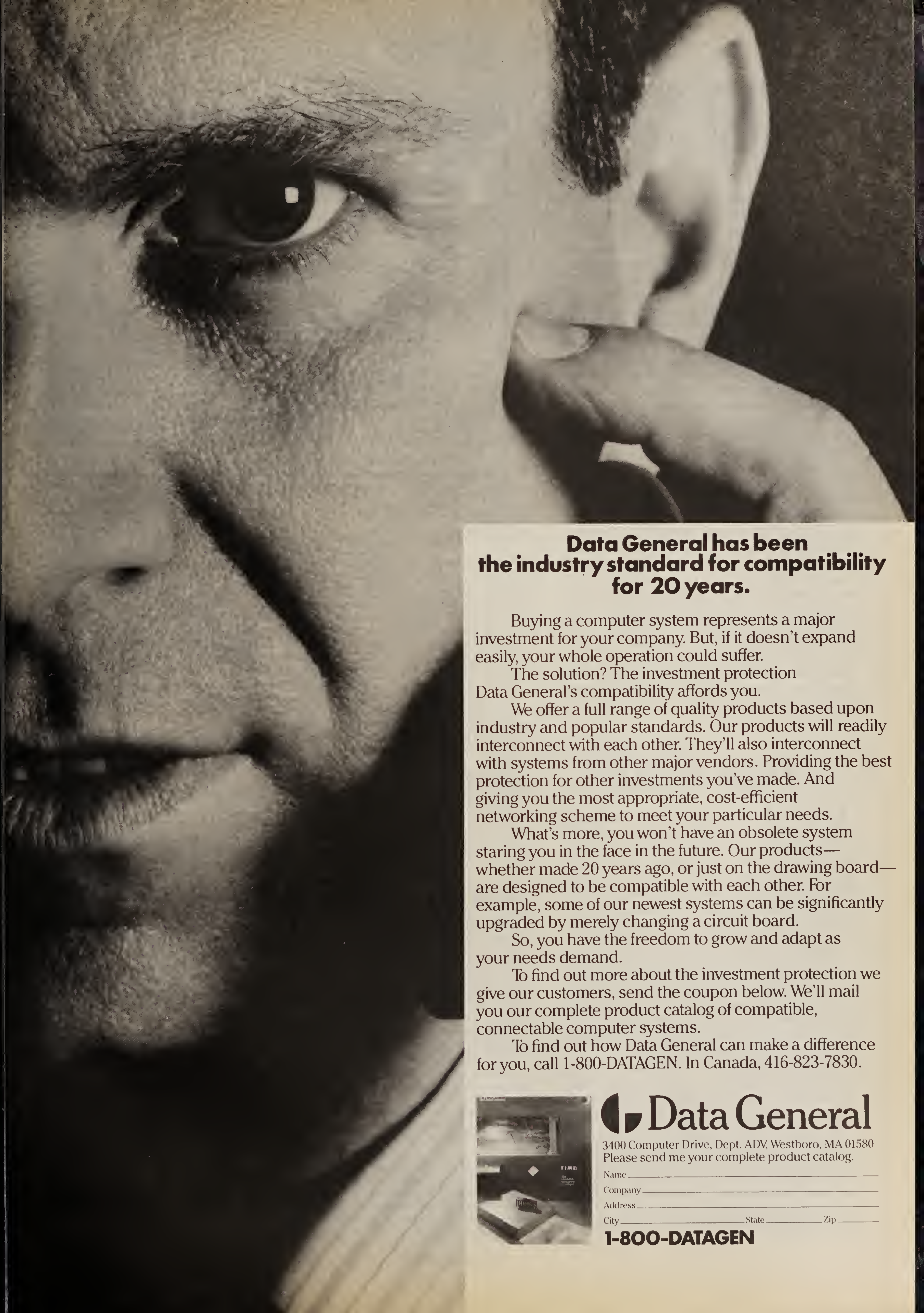

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EDITORIAL

Keeping secrets

The revelation that the National Bureau of Standards secretly tested an IBM compiler that conforms to the ANSI Cobol 85 standard should worry MIS shops that still rely heavily on that critical language. In arranging to have the test conducted in private, IBM has managed to have its cake and eat it, too: It can bid a product on government contracts that it does not offer to its customers.

It's not clear why IBM was allowed to skirt public disclosure rules on NBS compliance testing, but the reasons have to do with IBM's often obsessive concerns about wrapping unannounced products in a cloak of secrecy. Ironically, those concerns don't stop the company from routinely announcing other major products a year or more in advance in the name of providing statements of direction.

Customers interested in IBM's direction on Cobol 85, however, are faced with a dilemma. IBM officials belatedly admitted that a Cobol 85 compiler was far enough along in the development cycle to stand up to government testing, but the company refused to publicly acknowledge that such a product even exists. As a result, users who need the productivity benefits of the new language must choose between going with another vendor or sitting on the sidelines while IBM decides when to announce its compiler. Meanwhile, IBM retains its privilege to bid on government contracts involving Cobol without having to reveal to competitors that it is eligible for them. It's time for IBM to go public with its intentions.

A toast to MIS

Never does MIS directly affect so many people as during the holiday season. During the next 18 days, Americans will flock to malls and country stores, intent on spreading holiday cheer — largely on the backs of their credit cards. The result will be a deluge of telephone traffic as retailers comply with the more stringent credit authorization procedures now required by credit card firms.

With the specter of endless checkout lines looming in nearly everyone's mind, it's good to see that retail and credit firms have prepared carefully for the crunch. As this week's story on retailing shows, many merchants and lenders have substantially upgraded their point-of-sale systems to offset the increased activity.

American Express, for example, has gone from 200 POS systems in 1986 to more than 10,000 this year and is already planning for a doubling of transactions in 1988. And Visa is looking to continue the upgrades to its network that gave customers 99.98% uptime last year.

Like most MIS functions, these activities will go on invisibly. That's how it should be. But if you make it home early from holiday shopping this year, you might raise a toast to the computer professionals who helped you on your way.

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LETTERS TO THE EDITOR

ADAPSO query

The column "How to make IBM listen" [CW, Oct. 19] indicated ADAPSO has been attacking IBM's policy of preventing independent software companies (read independent consultants) from being able to build "complementary products for environments supplied by IBM operating systems."

How curious since, with its other hand, ADAPSO is perpetrating myths and misconceptions about independent consultants and is, in fact, trying to put them out of business (read ADAPSO supports the anticompetitive tax law known as Section 1706).

Isn't it time someone looked into ADAPSO's practices?

Richard Kuper
RK Enterprises
Forest Hills, N.Y.

Not his year

I read the article "The year of the customer" [*Computerworld Extra,* Nov. 18] with mixed emotions. Maybe IBM has been more open and cooperative with some of its larger customers. For me, it has been a different story.

Before last spring, I was having problems with IBM at every turn. Billing problems were out of control — I was getting everyone's bills but my own — I had trouble with the maintenance contractor and there were problems with new equipment. In other words, IBM could do no right.

After about 1½ years, I got fed up. At our local users group spring seminar, I stood up in front of about 400 local users and addressed my complaints to a shocked IBM panel. After the session, I was surrounded by four or five department heads, including the branch manager from my local office. All of them took my name and phone number and assured me that my problems would be taken care of quickly, and they would personally keep me informed of the progress in my case.

Not a single one of those people has bothered to call me back. My billing problems have gotten a little better — I get my own bills now, but only about every other one is correct. My maintenance contract is in effect — I get two bills for that — and all of my equipment is hooked up and working like it should.

The IBM people who are in the trenches with me really do help when I need them. But once I started moving up the management ladder, all complaints seemed to fall on deaf ears. I realize that my tiny account will have no effect on IBM's profit margin during this or any other year. But to answer the author's question, the only royal treatment I have gotten from IBM has been a burning pain.

W. H. Brantley
The University of Alabama at Birmingham
Department of Transportation Services
Birmingham, Ala.

This week in history

Dec. 5, 1977
AT&T's bid for immunity from antitrust prosecution because of its regulated status is rejected by the U.S. Supreme Court. The federal government is seeking to force AT&T to divest itself of its Western Electric manufacturing facility and its Long Lines division, which handles long-distance calls.

Dec. 6, 1982
U.S. travel agencies are up in arms, claiming bias built into automated airline reservation systems is costing them and their customers considerable time and money. Officials at American Airlines and United Airlines have even admitted that bias exists in their systems and that they developed the automated systems to promote their own flights.

Waiting to happen

The last paragraph of the In Depth article on James Martin [CW, Nov. 9] really summed up the reaction I had after attending one of his five-day seminars.

He presented ideas that have the potential to have a great impact on productivity, quality and the bottom line of not only MIS organizations but companies as a whole. The difficulty lies in implementing these ideas in the real world, which is resistant to change.

Perhaps as more of the leaders of MIS organizations attend the seminars, more progress can be expected in the future.

Jim Feurig
Software Specialist
Rochester Hills, Mich.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Share-and-share-alike systems

To go beyond data manipulation, we need universally available tools

AMY WOHL

When the winds of change blow through the computer industry, millions of workers can suddenly be offered new, potentially useful and often confusing tools. Right now, it is very windy.

More than 15 million people are now using some kind of personal computer in their daily work. In certain jobs, individual personal productivity tools — which let us calculate, analyze, write, edit, graph and track personal information — are all we seem to need. Most of us, however, get our information from somewhere else, work with others in developing the results and need to share the output with someone besides ourselves and our printer.

Computers that permit people to work cooperatively have been around for some time. However, multiuser systems have often supported each user as if he were in a separate world using a separate computer. Completed work could generally be sent from one user to another on the same system. But the programs have rarely supported context-sensitive conversation, annotation, negotiations and consensus building.

BILL RUSSELL

Work supports

A number of kinds of multiuser, computer-based work supports are now being touted.

- Local-area network vendors and providers of small multiuser systems (typically microcomputer-based, although they may masquerade under the name of a prominent minicomputer vendor) push the term "work group computing."

This concept refers to people working on terminals or PCs, all in a related job environment, such as the marketing department, and sharing a single information space. Users are typically physically attached and can move information in various stages from one desk to another.

Casually joining lonely PCs to achieve minimal levels of information and device-sharing is often seen as the second stage of system implementation. Better software could accomplish more profound levels of sharing, but the company's current product environment usually will not support anything better.

- Minicomputer vendors and mainframe companies repositioning their smaller, newer systems into friendlier environments prefer "departmental computing."

Often, it means the local group had a say in the system it is using and probably paid for it from a local budgetary pocket. As in the work group computing example, each user shares some of the same information space (again with a choice of terminal or, increasingly, PC workstations), but tools to let multiple users work together are noticeable largely by their absence.

Departmental computing systems may run only local applications, or they may support a mix of organizational applications and information access together with whatever types of local work needs computer support. They are often amalgams of so-called business solutions plus office automation, especially word processing, local electronic mail and file sharing.

- "Cooperative computing" is the chic new term to describe the real goal: letting people who work together be computer-supported in their joint tasks as well as their individual ones.

None of these terms is new. In fact, investigations into how people work together and academic attempts to understand and support such cooperative work date back to the 1960s. Early attempts included the ability to support multiple users viewing (and sometimes working together on) a single computer screen supported in two different work locations; an interest in jointly authored documents, particularly as they are managed in the academic publishing environment; and attempts to inform one user of another's computer-noted change of mind or information so that a related document could be automatically updated.

Tools for cooperative work might include the following:

- Multiauthoring tools that permit a number of authors to write sections of a cooperative paper and provide support for annotation, review and the negotiations of editing changes that must be jointly approved.
- Information filters that let researchers selectively receive information from each other's notes and papers without being inundated by full copies of entire opuses.
- Notification tools that let workers in a group know when information is received, events occur or other milestones happen that require individual or group action.

The term "cooperative processing" is probably incorrect here. Most computer writers today reserve that phrase to describe the use of multiple microprocessors that work together to enhance speed or function, such as the math coprocessors commonly used in PCs. Multiple users working, or trying to work, together are usually described as being in a "cooperative computing" environment.

It is time for the academic experiments to be declared a success and for us to invest in the development of cooperative computing software and environments. Today, we spend a great deal of time that was for-

Continued on page 22

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

On trial for willful computer sabotage

Can we balance the techies who are controlling computers with the concerned 'know-nothings'?

BUCK BLOOMBECKER

In a forest-green jumper, white roses clutched in hand, Katya Komisaruk was a perfect symbol of innocence betrayed. Motivated by the Nuremberg Principles, which hold citizens accountable for the actions of their government, the 28-year-old University of California at Berkeley MBA recipient had destroyed an IBM mainframe computer at Vandenberg Air Force Base in June. It was her personal effort to help the U.S. avoid nuclear war.

"I want so much to have a baby," she explained, "and I didn't feel I could legitimately become a parent unless I made a serious attempt at making the world safer for my child."

On Oct. 26, in U.S. District Court, she and her co-counsel Leonard Weinglass urged Justice William Rea to allow her to argue her case to a jury using the defense of "necessity," a legal doctrine that says a crime is excused if committed to prevent a greater crime.

Unless Justice Rea ruled in her favor, no evidence about the Komisaruk's motivations could be introduced at her trial for the sabotage and destruction of government property.

Central casting could do no better picking the opposing attorneys. Assistant U.S. Attorney Nora Manella, in a sharp red suit, rebutted the motion. "The defendant is not seeking to present any valid legal defense," she said. The defense strategy was one of "jury nullification," an attempt to "sway the jury by the sincerity of her beliefs."

And classic extras completed the scene. Filling the 75-seat courtroom, the peace movement lived again. Katya's supporters held white roses and occasionally gasped at a pro-prosecution ruling.

Lest the symbolism go unnoted, the White Rose Collective had distributed press materials on the courthouse steps at a press conference before the hearing.

Continued on page 22

BloomBecker is director of the National Center for Computer Crime Data in Los Angeles.

And the end-user survey says . . .

AMY SOMMERFELD FIORE

Picture an end user. Maybe he's a Lotus 1-2-3 user who has been content just to get the latest release when it comes out.

Maybe he's a cost accountant or sales executive who needs access to the corporate mainframe data.

Maybe he's someone doing word processing on the other end of a corporate-wide office automation system from you, someone who you've never heard of and who's never heard of you.

It's part of your job to satisfy this end user: keep the latest applications rolling out at a reasonable rate, keep the microcomputing standards in shipshape order, keep the hot lines staffed.

But it's also part of your job — and, let's face it, a bigger part — to satisfy the corporate officers at your company's helm. In order to please them, the hundreds of personal computers you have linked on high-speed lines must show solid bottom-line returns.

Tick, tick, tick

Looked at this way, "Keep the new applications rolling out" may mean "Don't sweat the details every time." Do what you can. Provide as much functionality as possible while the corporate clock ticks away and programmer dollars trickle out. If a department or end user wants more, well, the line forms to the rear.

But what if the end users' demands get a little louder? What if they outright reject the new application your developers just completed within budget and on time? What if every computer operator in the company refuses to use the word processor until it provides 10 programmable function keys?

MIS managers in West Germany face this possibility. According to the law of that land, a company's end users are entitled to one elected representative who judges the merits of any new system and gives his thumbs-up or thumbs-down. He is known as

Continued on page 22

Fiore is a *Computerworld* senior editor.

Sabotage

CONTINUED FROM PAGE 21

"During the Third Reich," the statement read, "a small group of gentile students, calling themselves 'The White Rose,' chose to resist Hitler. They tried to tell their fellow citizens what horrors were being committed in their name."

Computers have often been the target of symbolic attacks and other political protests. Terrorists have bombed computers as symbols of the "capitalistic-imperialistic conspiracy." Students occupied computer centers in the late 1960s to protest the Vietnam War. However, Komisaruk was calling attention to a specific computer used in a specific program.

It is well known in computer and military circles that the government is committed to the NAVSTAR global positioning system (GPS). Komisaruk had read *First Strike,* by Robert Aldridge, which argues that GPS is much more than a harmless navigation tool. She concluded that GPS was a threat to world peace. So, armed with crowbar, wire cutters, a cordless drill and hammer, she destroyed the computer she thought was at its core. (In fact, this computer was being stored; a similar one in Colorado was active.)

Aldridge, who was involved with the design and development of the Polaris, Poseidon and Trident missile systems, argues that "the United States has 90% achieved a disarming first strike capability. . . . With such a destabilizing capability, nuclear war could happen in three years or less."

I spoke about the case later that afternoon with a colleague who had recently left a job with a major aerospace contractor. "That shows what happens when know-nothings try to get involved in the complexities of military computer policy," he said. He acknowledged that some dissenters can reasonably argue military computer-use policies. But destroying a computer because of what one dissenter wrote in a book?

As I think about this case, a more fundamental question vexes me. I have long argued that the worst thing for the future of computing is to have it controlled by a small group of "techies" or bureaucrats who feel themselves insulated by the complexity of the technology they work with and not responsible to the worries or fears of the "know-nothings."

Judge Rea ruled that this issue will not be heard in his court. He granted the prosecutor's motion, holding that there was not enough evidence to convince him that Komisaruk would be able to mount a legal defense to support her claim of "necessity." She would get a jury trial but could not rely on the "necessity" defense.

The more, the better

I regret that a jury won't get the chance to consider the appropriateness of Katya Komisaruk's actions, as they recently did when they apparently agreed with those of Amy Carter. Carter was acquitted of trespassing after arguing that she was protesting what she considered illegal activities of the CIA. With an issue as complex and important as nuclear war, it seems to me that the more people involved in trying to figure out how to solve the problems the better.

The question each juror should reflect on, I suggest, is one that no reader, especially no reader involved in computing, can ignore: What can we as citizens do to ensure that developments in computer science bring us closer to peace and not closer to war? On this question, there can never be too much debate.

(On Nov. 16, a jury found Komisaruk guilty of one count of destroying government property. She will be sentenced on Jan. 11.)

Share-alike

CONTINUED FROM PAGE 21

merly spent in meetings and discussions in partnerships with our computer workstations.

If we are not to work increasingly in isolation, but rather use the growing power of workstations and systems to think better and see the relationships among various individually produced bits of information, then we need new tools.

What we need to do is take the available computer power and write software now (and at every future advancing step) that goes beyond letting us create or manipulate information individually and beyond moving it to another's work space.

We need universally available tools that let us work together. The time is ripe for their arrival and enthusiastic reception on our interconnected desks.

Survey

CONTINUED FROM PAGE 21

the *betriebsrat.*

He sits in on executive-level planning sessions and reviews all systems under development. If MIS cannot satisfy him — if you, for instance, could not persuade him that the system you built will not cause workers eyestrain, alter their job descriptions or force them to wait for 90-second response times — then the system goes back for revisions. If MIS cannot work things out with the *betriebsrat* in a mutually satisfactory way, then an arbitration board is called in. And their corporate clock ticks away, and their investment in PCs sits out there depreciating.

Picture again your own end user.

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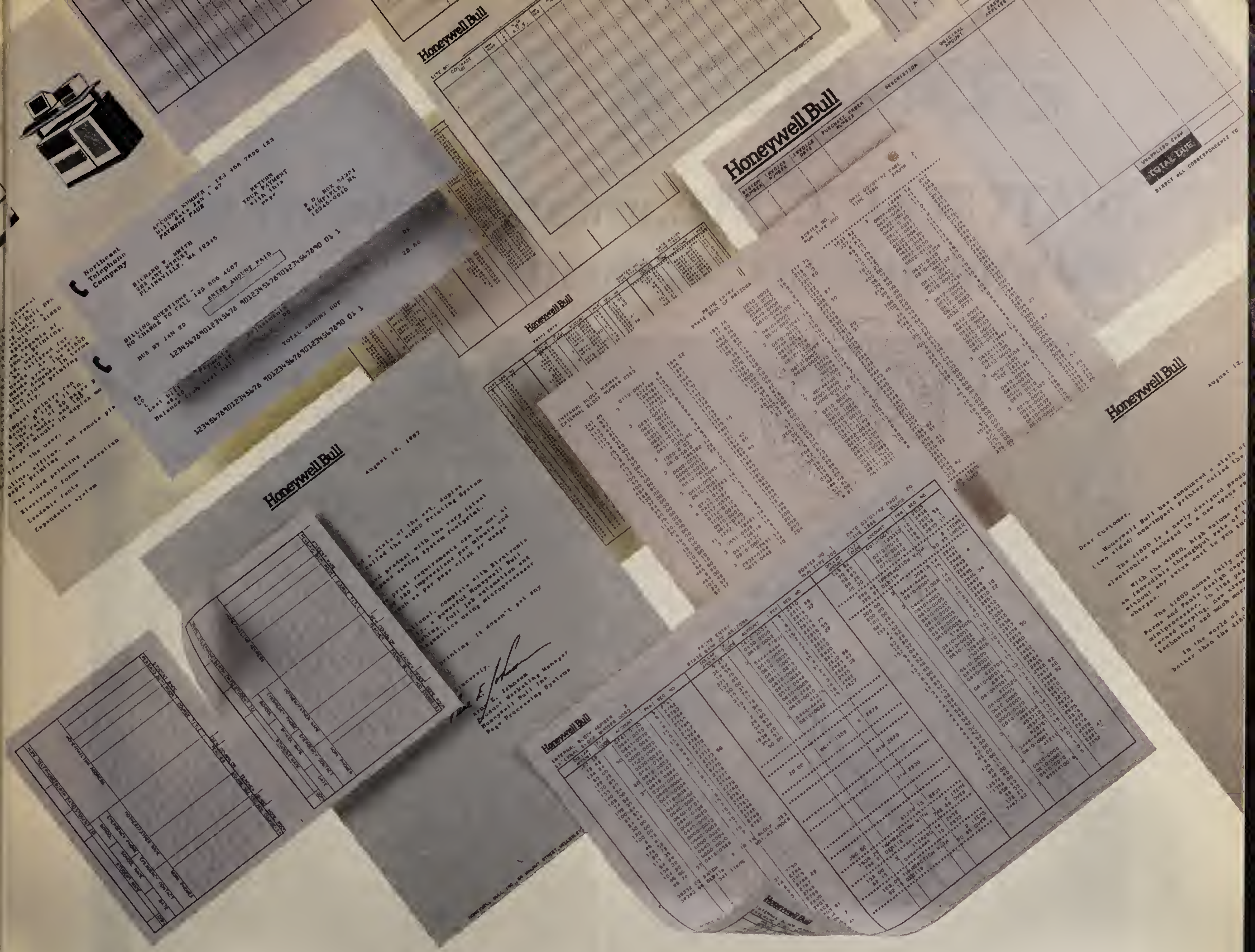

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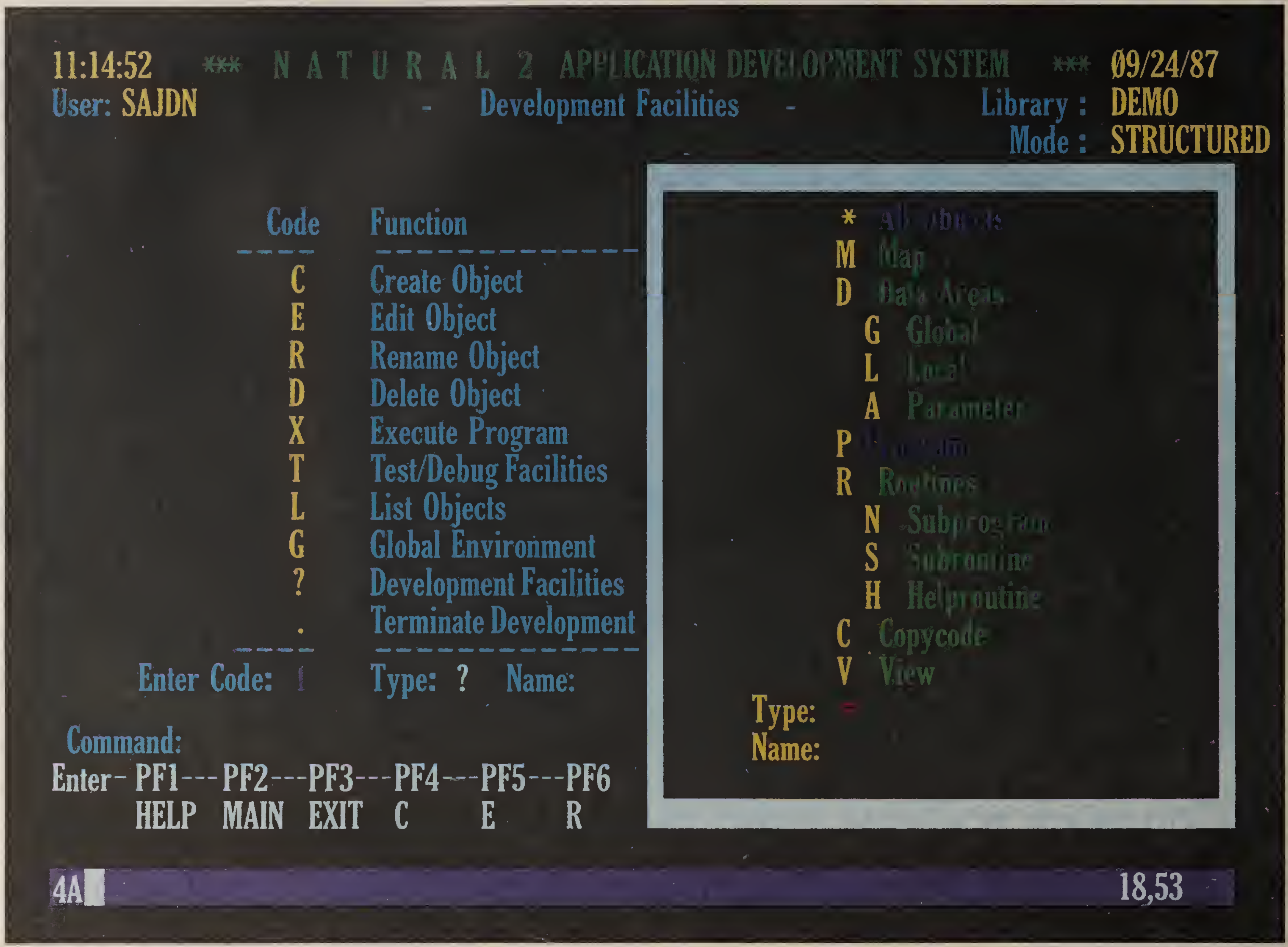

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11:14:52  ***  N A T U R A L  2  APPLICATION DEVELOPMENT SYSTEM  ***  09/24/87
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             Code    Function                          *  All Objects
             ----    ----------------                  M  Map
              C      Create Object                     D  Data Areas
              E      Edit Object                          G  Global
              R      Rename Object                        L  Local
              D      Delete Object                        A  Parameter
              X      Execute Program                   P  Program
              T      Test/Debug Facilities             R  Routines
              L      List Objects                         N  Subprogram
              G      Global Environment                   S  Subroutine
              ?      Development Facilities               H  Helproutine
              .      Terminate Development             C  Copycode
             ----    ----------------                  V  View
      Enter Code:    Type: ?   Name:                Type:
                                                    Name:
  Command:
Enter-PF1---PF2---PF3---PF4---PF5---PF6
      HELP  MAIN  EXIT  C     E     R

4A                                                        18,53
```

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WEEKLY.

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INSIDE

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SOFTWARE & SERVICES

SOFT TALK

Rosemary Hamilton

Questioning VM's status

In an interview last month, an IBM programming center manager was asked if VM was the primary operating system for the mid-range 9370s. He replied, "Uh huh."

A year ago, when the 9370s were first introduced, an IBM spokesman was asked the same question about VM. The 9370 had been rolled out with a cartload of VM products, including one version designed specifically for the mid-range systems.

Despite all the attention to VM, the spokesman said it was not the primary operating system for the 9370 because MVS and VSE ran on the new hardware, too.

The two replies confused me. Certainly, since the first time the question was asked there has been plenty of activity surrounding VM and the 9370. A new release of the specially packaged version, VM/IS, was introduced just a few months after the first release. Meanwhile, little was said about the other operating systems in relation to the 9370.

But did that mean that during last month's interview, IBM decided to change its public po-

Continued on page 26

Peat Marwick automates audits

Expert system shell used to aid commercial number-crunching

BY ALAN ALPER
CW STAFF

NEW YORK — Peat, Marwick, Main & Co. is banking on the advice of an expert system to bring more consistency and precision to the auditing of commercial bank loans.

The Big Eight accounting firm used a shell, called Level Five, developed by Level Five Research, Inc., a company acquired last summer by Information Builders, Inc., to devise an expert system to assist auditors in assessing commercial banks' potential loan losses and reserves needed to cover bad debt.

The 6,000-rule expert system, called Loan Probe, was developed on an IBM Personal Computer AT and includes some 60 Pascal programs to handle the number-crunching of the auditing process.

Level Five is developing an interface to link its expert system shell to Information Builders' Focus fourth-generation language and data base management system, and a Peat Marwick representative said his company is interested in this effort.

Gary Ribar, senior manager of Peat Marwick's audit research group and primary developer of Loan Probe, said such a link could facilitate the extraction of vital financial data directly from a client's mainframe data base into Loan Probe. "Knowing Information Builders' plans for the product could be feasible down the road," Ribar said.

The Focus interface is expected to be released in the middle of next month, a Level Five spokesman said.

The Loan Probe will also be ported by Level Five to Apple Computer, Inc.'s Macintosh early next year.

Development on Loan Probe began in 1984. While automating the auditing process and saving clients money were of concern to Peat Marwick, they were not the overriding reasons for developing an expert system.

Adding precision

"We wanted to add a degree of precision to auditing that had not existed before," Ribar recalled.

Peat Marwick decided a micro-based expert system made the most sense, since auditors needed a tool they could carry with them as they made their annual rounds of commercial banks from September through January.

Level Five consists of an inference engine, which uses frontward and backward chaining logic and goal outlining; a knowledge-base compiler and editor; and modules that provide access to DBMSs such as Ashton-Tate Corp.'s Dbase II and Dbase III. English syntax is used to develop the rule grammar.

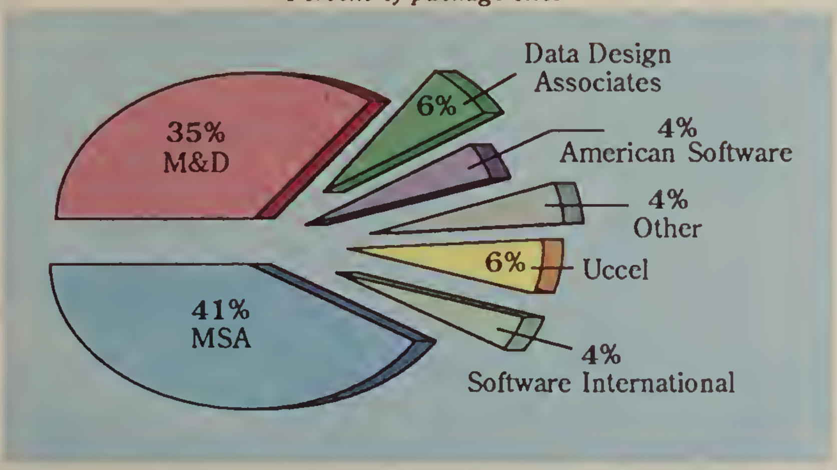
Ribar traveled the country from mid-1984 through late 1985 interviewing Peat Marwick auditors to distill information for Loan Probe's knowledge base.

Level Five's English syntax programming method allowed Ribar, who is an auditor by train-

Continued on page 27

Data View

Fixed-asset software
Percent of package sites



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART

VM/CMS adds Profs utilities

BOSTON — VM/CMS Unlimited, Inc. late last month added two products to its lineup of utilities for the IBM VM operating system and also announced enhancements to two existing products.

Full Screen Prompter and Text Display Facility, both of which are available immediately, are designed for use with the CMS component of VM and the IBM Professional Office System (Profs). Full Screen Prompter provides a full-screen interface for entering or editing data fields within format files in a CMS environment. It can be used to assist in document creation and revision within Profs.

The Text Display Facility is a full-screen facility used to view CMS data. Designed for use with large documents, it helps users locate specific sections within the document, the company said.

Both products were designed by Amoco, Inc., and VM/CMS has marketing rights. Each carries an annual license fee of $1,800, but reportedly will also

Continued on page 27

Inside

- Cognos enters computer-aided software engineering market. Page 26.
- Microsystems Engineering integrates Mass-11 with DEC's All-In-1. Page 31.

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Cognos bridges 4GL, Excelerator

BY CHARLES BABCOCK
CW STAFF

OTTAWA — Cognos, Inc. is entering the computer-aided software engineering market by offering a bridge between its Powerhouse fourth-generation language and Index Technology Corp.'s front-end design tool, Excelerator.

The bridge is said to allow Powerhouse users to design an application using Excelerator and then upload the files from Excelerator's dictionary to the Powerhouse dictionary.

Because Excelerator is used on an IBM Personal Computer XT, AT or compatible and Powerhouse is used on a Digital Equipment Corp. VAX, the transfer occurs between operating environments as well as software products, Cognos said.

The bridge, called Phlex, modifies the Excelerator dictionary, enabling it to transfer data models, entity relationship models and other elements of the Excelerator design phase to the Powerhouse dictionary, according to Ron Nordin, Cognos vice-president.

Less than 100%

The integration between the Excelerator and Powerhouse dictionaries falls in the range of 95%, Nordin added.

Phlex will be available in January. Final pricing has not been set but is expected to fall within the $1,500 to $1,800 range, product manager Paul Rhoades said.

Approximately 8,000 licenses have been sold for the Powerhouse fourth-generation language, according to company officials.

Hamilton

FROM PAGE 25

sition on VM's role with the 9370?

I asked the programming center manager about this. Before he could respond, a colleague of his asked me what I meant by the word "primary."

What does it mean?

I paused, wondering what to say. Sometimes it's the simple things that get you. I couldn't understand why he'd ask me something that I thought was self-explanatory.

I mean "most important" when I say primary. I mean what everyone else means when they use the word primary, right? Not necessarily.

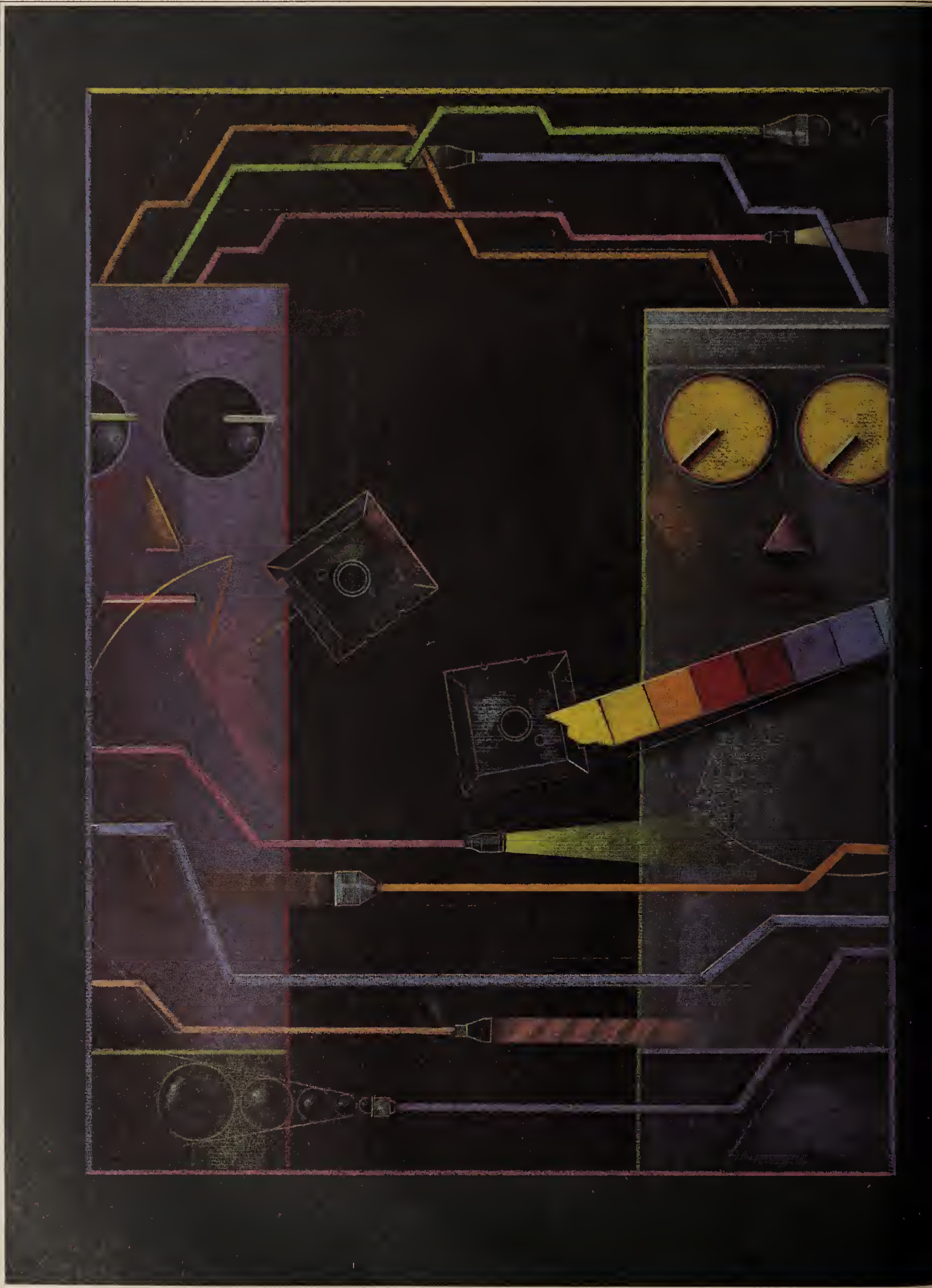
The programming center manager now wanted to tell me what he meant when he used the word primary.

He spoke about the dual role of the 9370 and how it will serve as both a host to small computing environments and an end-user system in a distributed environment. He wrapped up with, "So with primary, as in primary operating system, the thrust here is to continue to do what we've done very successfully in the past, which is transaction processing and batch with VSE, and expand on what we've done successfully in VM/CMS. What the customers have said is the area for rapid expansion is in end-user computing."

Essentially, this explanation is a safe answer that could keep most people happy. My guess is that the programming center manager's initial response was more representative of what IBM really thinks. In other words, for the record, there will be no primary operating system, but in reality the company will be devoting its resources to VM to improve its lot in the distributed end-user business.

If IBM's line is not just a safe response, then we should be hearing more about VSE and the 9370. A recent random survey at *Computerworld* of 10 9370 users turned up seven VSE users. They certainly are out there, and if they are so closely tied to IBM's plans for the 9370, let's here more about those VSE plans.

Hamilton is a *Computerworld* senior writer.



Peat Marwick

FROM PAGE 25

ing, to do most of the development work himself. After numerous refinements, Loan Probe was unveiled last summer. Interestingly, Ribar said coding took only four weeks. "Because the problem was so unstructured, it took a long time to do the knowledge engineering," he explained.

Loan Probe asks the auditor a series of questions about the bank, the borrower and the loan, including whether the loan is secured or if guarantees exist. It then asks the auditor for judgments on the loan valuation and asks him to rank on a scale of 0 to 100 his confidence level in a particular answer.

Loan Probe also contains data bases that provide economic projections for 150 different industries to enable the system to evaluate loan risks within a particular business context.

The final analysis on loan reserves emerges in the form of a "line of reasoning report" that is based on answers to Loan Probe's questions. Loan Probe also provides five narrowly defined categories to assess loan risk probabilities within what used to be a single substandard category.

Users like it

So far, Loan Probe has been placed at two dozen of Peat Marwick's 137 offices nationwide. Response to Loan Probe has been positive, according to David Carter, a senior audit manager in Peat Marwick's Tulsa, Okla., office who has used the system.

Initially, Loan Probe took auditors 25% to 30% longer to do audits, he noted. As auditors master the system audit, time is expected to decrease compared with manual methods.

"The overall time benefit comes when doing the analysis," Carter said. "You don't have to go back and rewrite your report, since it's done for you by the system."

Expert systems consultant Tom Schwartz of Tom Schwartz Associates in Mountain View, Calif., said Peat Marwick's Loan Probe is a natural application of artificial intelligence. "The expert system captures most of the repetitive part — 80% to 90% — of what the auditor does," he said. "This frees the auditor to make critical judgments on the additional 10% to 20% of the audit."

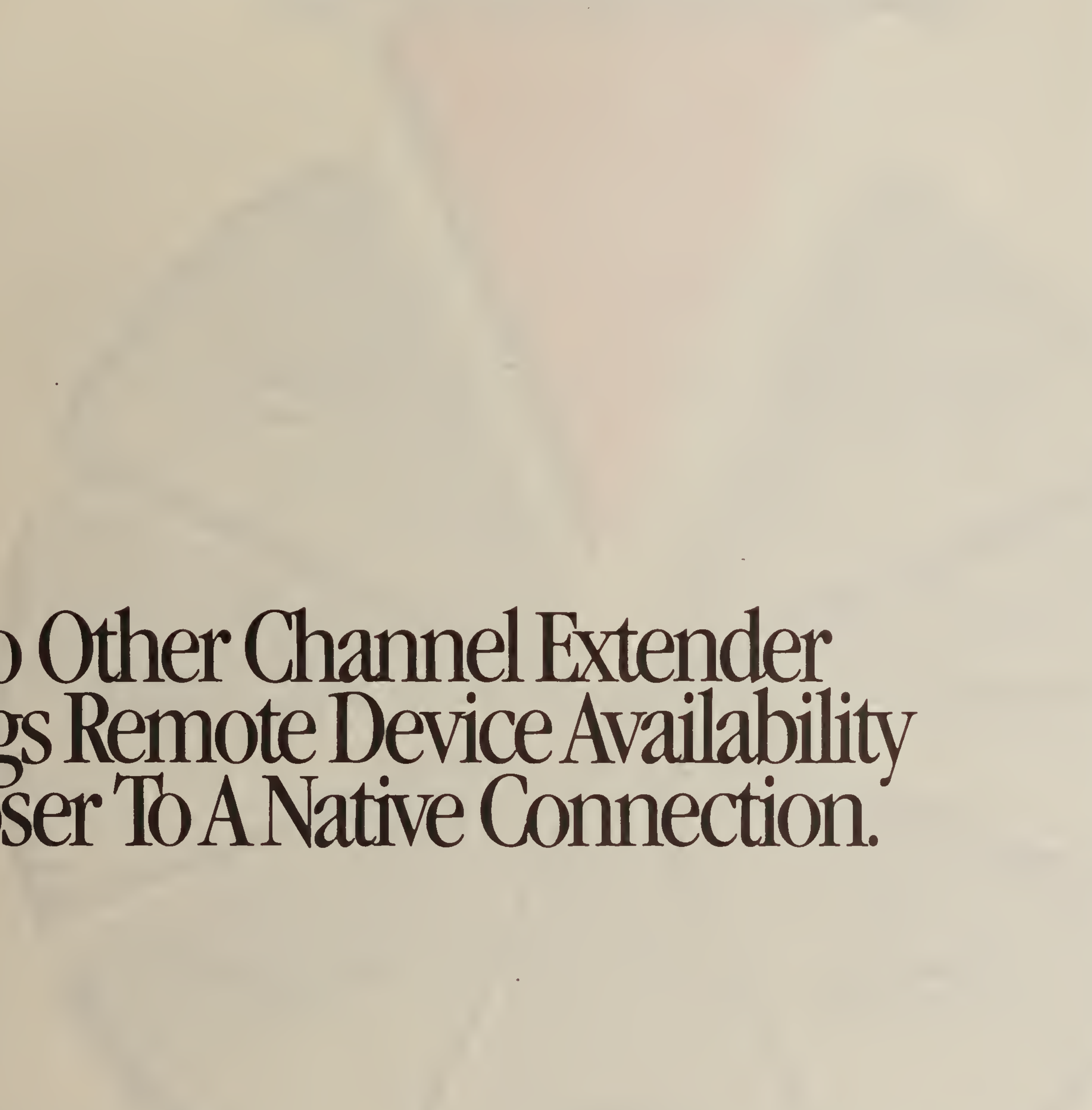
VM/CMS

FROM PAGE 25

be offered as a package for $3,000 per year.

Meanwhile, VM/CMS enhanced its Single System Image product, which links VM processors to share system resources. The product now supports two additional security systems, IBM's RACF and VM Software, Inc.'s VM/Secure. With this support, users can access either security package from more than one CPU. This upgrade is available immediately at no extra cost.

The company also introduced Version 2.0 of its own security package, Autolink. With this version, minidisk passwords are replaced with access rules that are said to be flexible and easy to manage by the user. This upgrade is available at no extra charge.



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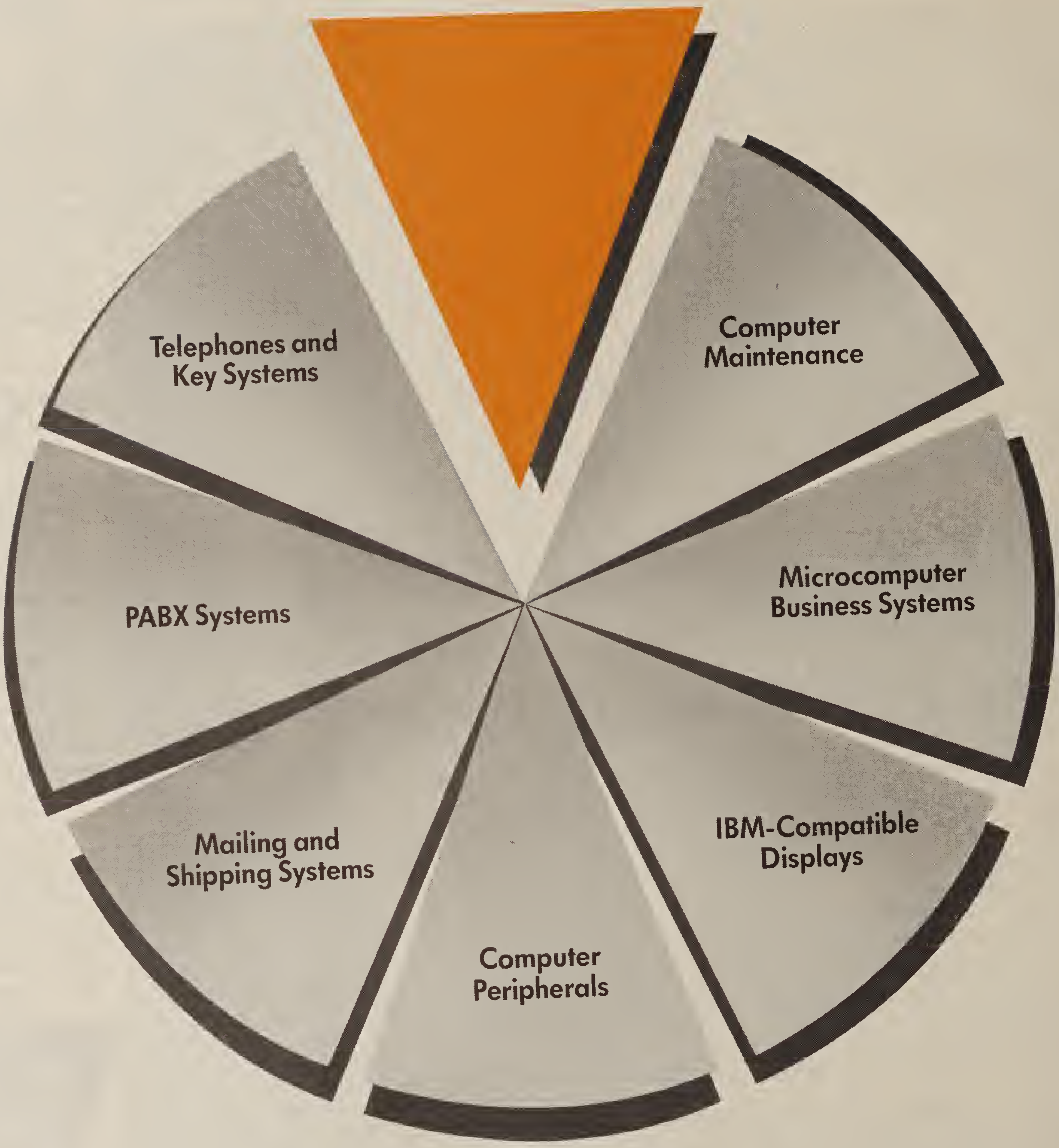
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NEW PRODUCTS

Systems software

Microsystems Engineering Corp. has integrated its **Mass-11** word processing systems into the file cabinet of Digital Equipment Corp.'s All-In-1 office automation system.

According to the vendor, the gateway provides access from All-In-1 to Microsystems office automation software, including a relational data base management package and a graphics processor. It also allows All-In-1 to accommodate such laser printers as the Hewlett-Packard Co. Laserjet series and those compatible with Adobe Systems, Inc.'s Postscript.

A series of gateway products allows users to transfer editable files from Mass-11 to Decmates, IBM 5220s, IBM's Displaywriter and Wordperfect Corp.'s Wordperfect.

The Mass-11 All-In-1 Integration Gateway is priced from $1,850 to $5,750.

Microsystems Engineering, Suite 400, 2400 W. Hassell Road, Hoffman Estates, Ill. 60195. 312-882-0111.

Applications packages

Fujitsu Microsystems of America, Inc. has announced that **The Works**, a word processing software package designed for Pick Systems' Pick operating system, now runs on Fujitsu's eight-user System 2000 and 20-user System 2020.

The Works, developed by Jet Software in Tustin, Calif., is a menu-driven program featuring on-line Help screens, a spell checker, footnotes, double underlining, text highlighting, table of contents and index generation, multicolumn printing and a function for cut and paste operations.

The Works is priced at $395.

Fujitsu, 3055 Orchard Drive, San Jose, Calif. 95134. 408-434-1160.

The **MRC-Desktop Organizer** software for use with the IBM System/38 has been announced by **Michaels, Ross & Cole Ltd.**

The software is said to feature a pop-up window interface, context-sensitive Help, the ability to select a specific group job for entry, a daily appointment calendar, a note pad, a two-mode calculator and a personal name and address directory.

The MRC-Desktop Organizer costs $1,940.

Michaels, Ross & Cole, Suite 304, Building E, 800 Roosevelt Road, Glen Ellyn, Ill. 60137. 312-790-5040.

Utilities

An AT&T Unix System V Release 3.1 **VAX Porting Kit** has been announced by **HCR Corp.**

Designed to provide users with the basis for porting the latest Unix release to Digital Equipment Corp. VAX configurations, the kit was produced by adapting the AT&T 3B2 version of Release 3.1 to the VAX architecture. It runs unmodified VAX Release 2 binary programs.

The porting kit is available to Unix source code licensees for a basic site license price of $7,500.

HCR, 10th Floor, 130 Bloor St. W., Toronto, Ont., Canada M5S 1N5. 416-922-1937.

Version 2.0 of **Searchmate**, a text-retrieval program for Digital Equipment Corp. VAX computers, has been announced by **Automated Office Systems.**

Enhancements include a session-interrupt feature that allows users to read and respond to mail or to access other programs.

According to the vendor, multiple current sessions can be managed with a hot key that has the ability to switch between sessions.

Frequently performed sessions can be captured, saved and replayed while multiple concurrent users are supported, the vendor said.

Searchmate is priced depending on the number of information bases to be managed and the system configuration.

A license for one information base and one minicomputer is priced at $5,000. Larger systems cost up to $19,500 per site.

Automated Office Systems, P.O. Box 100, Western Bank Building, Albuquerque, N.M. 87103. 505-842-1247.

Services

A system said to convert macro-level CICS code to command-level CICS code has been announced by **Belcastro Computer Services.**

The system converts either Cobol or assembler source code. The code is converted directly to command-level code and does not simulate command-level processing through the use of symbolic addressing of the storage operation.

The two-pass operation analyzes and then converts the source code. In addition to converting the code, an output listing is provided. The conversion is done at the Belcastro Data Center using an IBM 4361 mainframe operating under VM/CMS. A 1,600 bit/in. tape is used as the mode of transfer.

The cost of converting from macro- to command-level CICS ranges from $150 to $200 per program.

Belcastro Computer Services, 120 Millcreek Road, Niles, Ohio 44446. 216-652-1628.

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MICROCOMPUTING

MICRO
BITS
Ed Scannell

Catch the desktop wave

What's all this talk about desktop publishing? After months of generous press coverage, it appears the Fortune 1,000 is catching the desktop publishing wave. A recent study by Computer Intelligence showed that desktop publishing software accounts for 25% of planned microcomputer software purchases among Fortune 1,000 accounts.

Tied for a distant second place are computer-aided design and manufacturing and presentation graphics applications. Not surprisingly, the study showed that Aldus has a 53% share of the Fortune 1,000 desktop publishing market and that Xerox's Ventura Desktop Publisher holds second place with a 40% share.

What's all this talk about microcomputers? A recent study by the Gartner Group and Comtec Market Analysis Services showed that while more and more business people are using microcomputers, 72% of all U.S. companies still don't own one and only 11% of these companies plan to buy one this year.

Continued on page 44

Funk adds to 1-2-3 offerings

Package includes file manager to compress, catalog, describe and archive

BY DOUGLAS BARNEY
CW STAFF

Funk Software, Inc., the firm that rose to prominence with a product that prints Lotus Development Corp. 1-2-3 work sheets, last week added a set of six 1-2-3 add-in tools to its product offerings.

The $99 package, dubbed The Worksheet Utilities, includes a search-and-replace feature, a formula editor and a work sheet file manager.

According to President Paul Funk, the file manager also provides some Microsoft Corp. MS-DOS capabilities, such as copying, moving and erasing files. The package can also retrieve lost files and search work sheets for specific labels, according to Funk.

A key component of the package is a file manager used to organize work sheet files. With the file manager, users can compress work sheets and catalog, describe and archive these files, the vendor said. The package operates as a random-access memory-resident program, but only the module in use is loaded into memory.

Formula exposed

The $99 package also includes a formula editor that allows users to work with formulas from a multiline display that shows the entire formula, as opposed to 1-2-3's 80-line display.

As a Help facility, the formula editor provides a pull-down menu listing 1-2-3's @ functions. Users can choose the needed @ function from the menu and are then prompted to enter the arguments specific to the function. Formulas can also be easily debugged through both automatic error highlighting and step-by-step calculations, Funk said.

The search-and-replace feature allows a user to search a work sheet for text, values or formula elements and replace these at the user's discretion.

The range column-width feature sets the width of a range of columns, rather than each column individually. And the package's autosave feature will save work sheets at intervals set by the user.

Print settings show all the print formatting data, such as margins and headers, on single display. They also provide different settings to be developed for different tasks, which can be called up by name.

Funk is confident that The Worksheet Utilities technology will carry forward to new Lotus releases of 1-2-3, such as 1-2-3 Release 3, which is due out next year.

Funk is also planning to develop add-in products for Borland International's Quattro spreadsheets as well as Microsoft's Excel for IBM Personal Computers and compatibles.

Funk also recently released a new version of Sideways that allows for the sideways printing of work sheets without exiting 1-2-3.

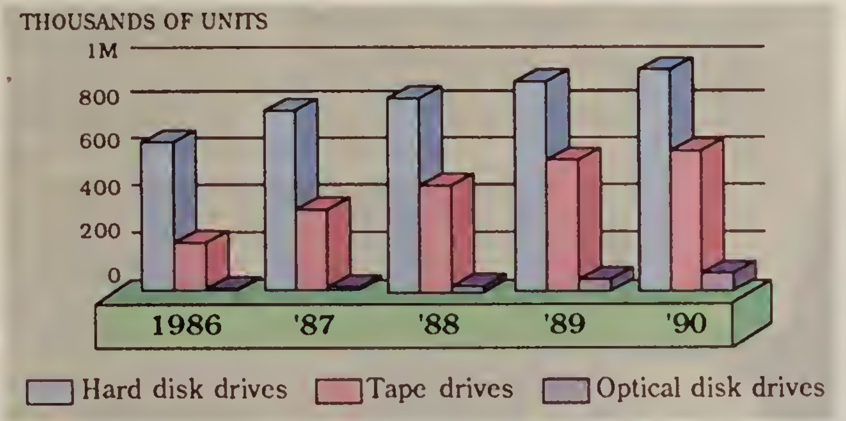
In addition, Funk offers an add-in cell-annotation package and a 1-2-3 word processor.

Inside

- Osborne fights Lotus in the market and the courts. Page 35.
- Unix-DOS packages seen as solution. Page 35.
- IDR unveils full-color image processing system. Page 48.

Data View

PC mass storage forecast
Worldwide, 1986 to 1990



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Kalok KOs Winchester cost, shoots market prices down

BY JAMES A. MARTIN
CW STAFF

The cost of 3½-in. Winchester hard disk drives is expected to plunge next year, partly with the help of a Sunnyvale, Calif.-based start-up company.

Kalok Corp., founded in February with just $1.5 million, recently said it plans to introduce the first of its small-form factor hard disk drives next month. The significance of the introduction, according to observers, will be Kalok's strategy of pricing the product low enough to significantly undercut competitors, subsequently driving down OEM and retail prices for low-end 3½-in. hard disks.

The smaller hard disks gained greater acceptance this year as laptops and small-footprint microcomputers came into vogue.

Continued on page 41

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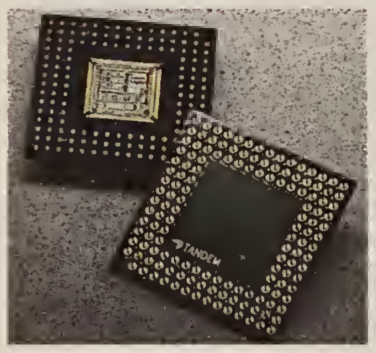

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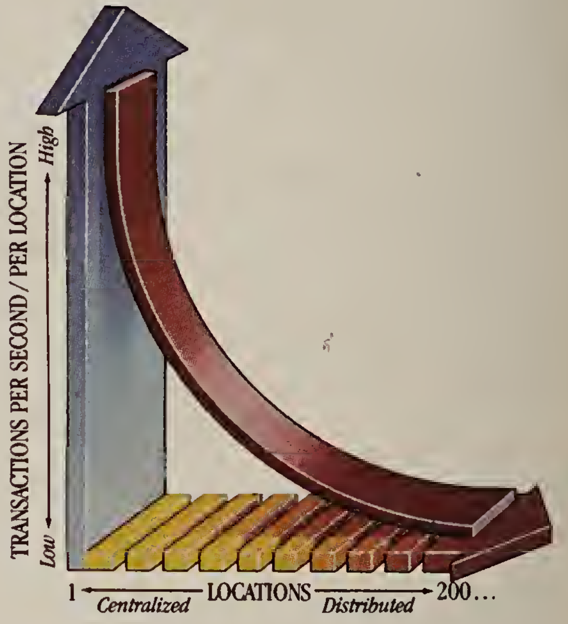

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SMALL TALK

William Zachmann

Lasers for the masses

Q: What costs $2,199, reliably makes great marks on paper, emulates a Hewlett-Packard Co. Laserjet Plus and an IBM Wheelprinter and can be bought and serviced in small-town America as easily as in big-city America?

A: An LP 1000 laser printer from Tandy Corp.

Personally, I am very distrustful of new technology. I still don't like to buy cars with automatic transmissions because there is so much more that can go wrong with them than with a manual transmission. I wouldn't even consider buying a car with front-wheel drive.

With that kind of disposition, it should come as no surprise that I wasn't the first on my block to buy a hard-disk system back in the old days (which are now the early 1980s). I just didn't trust the things. I felt a lot safer for a long time with my old twin-floppy IBM Personal Computer. Of course, once I started using hard-disk systems early in 1985, you couldn't get me away from them.

I have had a similar attitude toward laser printers. When I wanted better text and graphics than my old Gemini Star, I bought an IBM Quietwriter II. It wasn't the fastest thing around, but it had a mechanical system as simple as a standard transmission. I felt I could trust it.

Laser printers were just too complicated for my taste; be-

Continued on page 41

Battle-hardened Osborne digs in, fights Lotus in the market and in the courts

IN PERSON

Adam Osborne has seen it all in the microcomputer industry. As the founder of Osborne Computer Corp., Osborne pioneered portable computing and the bundling of applications software with hardware; he also helped spread the now-defunct gospel of CP/M. Although Osborne Computer reached an unfortunate and public demise, many loyal users are still hammering away at Osborne keyboards.

He now has a new challenge: Paperback Software International, which he founded, is going toe to toe with Lotus Development Corp. with VP Planner, a low-priced Lotus 1-2-3-compatible spreadsheet. But Osborne must also defend a major lawsuit by Lotus over copyright infringement concerning Osborne's alleged cloning of 1-2-3.

Osborne spoke last week with *Computerworld* Senior Editor Douglas Barney about his battles with Lotus and trends in the software market.

What is your opinion of Lotus's upcoming 1-2-3 Release 3?
From all the comments I have seen, they are coming up with something that is still inferior to most of the competitors on the market. Maybe that will act as a stopgap for a while.

For example, they are talking about having a three-dimensional random-access memory-resident spreadsheet. Three dimensions doesn't cut it. All that allows you to do is one set of consolidations.

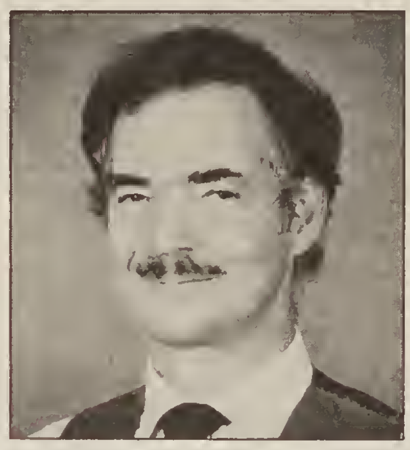
People who do consolidations are usually doing budget accounting. Four dimensions is minimum for budget accounting, and five dimensions is preferable.

The idea of having a RAM-resident 3-D spreadsheet will limit the applicability of the product to relatively tiny companies.

With VP Planner, each data base can be up to 17M bytes, and a spreadsheet can access six of them, and each of them is five dimensions.

What kind of advance is this that they are talking about?

Why are people buying VP Planner?
Some have bought it on price. Many have bought it to do consolidations using the multidimensional data base. Others have bought it for the Dbase capabilities [VP Planner reads and writes Ashton-Tate Corp. Dbase files]. They want to be able to selectively import files.



Adam Osborne *prepares for court battle with Lotus*

That is another question: why doesn't Lotus do something along those lines? It is something everybody needs. But if they came out with the ability to load Dbase files or write to a Dbase file, they would be, in their opinion, giving a de facto endorsement to the product when they are planning to come up with their own data base product.

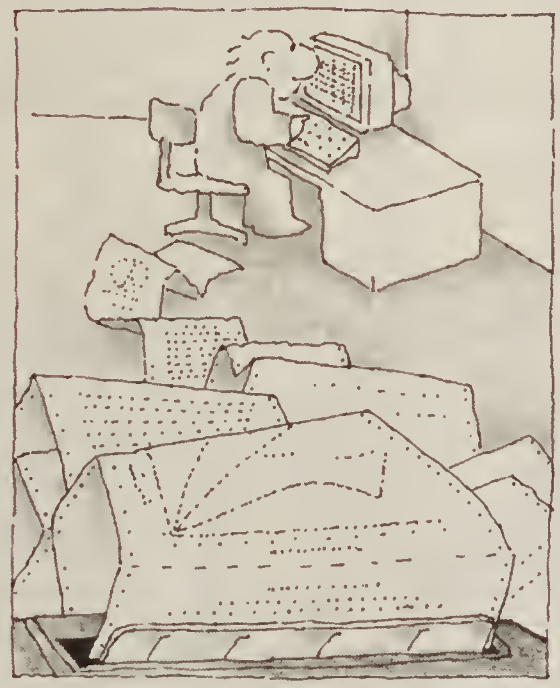
How many use VP Planner in conjunction with 1-2-3?
Many are. What happens is a company already has a Lotus standard, and they aren't going to hassle with trying to get the company to change its standard.

Those people that are using Dbase and spreadsheets will get VP Planner, and MIS will get it to do their consolidations. Then they continue buying 1-2-3 for the rest of the company.

Continued on page 41

PC MULTITASKING

Folding DOS into Unix



PETER PERRY

BY EDDY GOLDBERG
SPECIAL TO CW

Problem: How can MIS and microcomputer managers today leverage their installed base of MS-DOS applications and IBM-compatible personal computers by adding multitasking and multiuser capabilities?

Solution: Run those existing DOS applications as a task under Unix on their current 286 and 386 machines.

Unix-based solutions exist today that work with the current Microsoft Corp. MS-DOS and Intel Corp. 80286 and 80386 standards. These products allow PC managers to run their MS-DOS applications tasks under Unix without rewriting them, as is required with IBM and Microsoft's OS/2.

Continued on page 36

Micropro hurls late entry into Mac word processor pack

BY STEPHEN JONES
CW STAFF

SAN RAFAEL, Calif. — Despite its late arrival, Micropro International Corp. is betting that a newly acquired product will help it crack the word processing market for the Apple Computer, Inc. Macintosh.

Micropro, once the highflier of word processors, plans to release a package developed for the Mac by Homewood, Ill.-based Challenger Software during the first half of next year.

Leon Williams, president of Micropro, said the Challenger word processing program takes advantage of the Mac's desktop publishing features with fully integrated layout and graphics capabilities.

Williams claimed that the word processing component of the package offers at least the same speed and functionality as the company's latest product for the DOS world, Wordstar 2000 Release 3. The Mac product will carry the Wordstar label.

Micropro is one of several companies, including Borland International, Inc. and Symantec Corp., that have recently made a push to get into the Mac market. Analysts said they believe sales of Mac productivity software will take off as the popular microcomputer continues to gain acceptance in the corporate marketplace.

But Micropro's word processor entry might be too late to take advantage of the anticipated sales boom. Companies such as Microsoft Corp. and T/Maker have established impressive beachheads in the Mac market that will not easily yield to a newcomer.

"The window for becoming an early entrant in the Mac market is closing quickly; Micropro couldn't have delayed this much longer," said Michael Goulde, an analyst with The Yankee Group in Boston.

That does not bother Williams, who said he believes there is still plenty of opportunity to stake out a strong presence with Mac users. By offering integrated graphics and layout, Williams said, his firm hopes to win over both new customers and current users of Microsoft's Word who want more desktop publishing capabilities.

"It's never too late to get market share if you start doing things better than the competition," he said.

Micropro's deal with Challenger calls for one product to be released by the second quarter of 1988 with updates coming six months, one year and two years after the initial release. Williams said the number of upgrades could be scaled back according to customer demand.

Challenger, which sells a three-dimensional graphics package called Mac3D, will be paid about $3 million during the three-year contract period and will participate in joint marketing and development with Micropro.

Williams said the first version of the product will be a generic release not aimed at any specific group of users. Later releases may reflect Micropro's new strategy of tailoring releases of Wordstar 2000 to vertical markets, such as the legal and medical professions.

Pricing has not been set for the Mac product, but Williams said it will be positioned as a high-end package.

Unix-DOS

FROM PAGE 35

The gains from applying this strategy to the installed base of MS-DOS applications and IBM-compatible PCs include multitasking and multiuser capabilities, increased processing power and a greater ability to communicate upward to corporate mainframes.

Two firms trying products that merge Unix and DOS are Ford Aerospace and Communications Corp. in Houston and Midland Mutual Life Insurance Co. in Columbus, Ohio. Both report positive results.

NASA evaluations

Ford Aerospace is under contract to the National Aeronautics and Space Administration to maintain operating systems for NASA's PC users and to evaluate new software for possible use there. Peggy Hill, a software analyst at Ford Aerospace, was a beta user of Microport Systems, Inc.'s DOS Merge 286. She has since moved to the final version of the product.

Hill says the demand for Unix came from NASA's DOS users, who had used a Unix system for development, C programming and communications but still liked their DOS packages. "We wanted to be able to merge DOS and Unix together. Users [at NASA] wanted a Unix operating system but were used to DOS and already owned all the applications," she says.

Her group had been evaluating the package from the Unix side; another group evaluated it from the DOS side. Ashton-Tate Corp.'s Dbase III, Lotus Development Corp.'s 1-2-3, Micropro International Corp.'s Wordstar and standard DOS commands have been tested, and Hill says the results were very good.

She also tested a tape backup package that had not worked under Unix. "It works under DOS Merge because [DOS Merge] uses DOS device drivers to access the hardware," she explains. NASA's PC users have been using The Santa Cruz Operation, Inc.'s (SCO) Xenix on a partitioned physical hard disk, but each time the users want to switch from DOS to Xenix, they have to reboot and activate the DOS partition, which means extra work and time.

According to Hill, the DOS Merge package allows DOS and Unix to exist on the same disk simultaneously, so users do not have to switch back and forth between partitions. The limitation is that Unix-DOS merge solutions on the 286 can run only one DOS application at a time as a task under Unix.

Hill says she is looking forward to receiving Microport's DOS Merge 386, which will allow multiple DOS tasks to run simultaneously under Unix or Xenix. It is due out this month.

SCO options

In addition, Hill has ordered SCO Xenix 386 and SCO Multiview, a windowing package, from SCO. She says she plans to order SCO VP/IX, which will allow DOS to run as a task under Xenix, as soon as it becomes available. The 386 version of SCO VP/IX is due out this month.

SCO gets its VP/IX systems software from Interactive Systems Corp. in Santa Monica, Calif., which developed it with Phoenix Technologies Ltd., a Norwood, Mass.-based vendor of MS-DOS software. A spokesman for Interactive says VP/IX for the 386 is complete and available to OEMs now. Referring to SCO's decision to bypass a 286 version of VP/IX for now, Hill says the firm "thinks the 386 is what people will want more in order to run multiple DOS programs simultaneously, which you can't do on the 286."

When a broad base of applications for OS/2 finally arrives, which Hill says she does not expect until mid-1988, she will compare OS/2 with Unix and Xenix in terms of cost, speed and how well it runs certain types of applications. "If it's a lot faster than Unix, that would be a plus. It would be interesting to see benchmarks on its speed," she says. "DOS users love speed."

Unix-DOS software for the end user

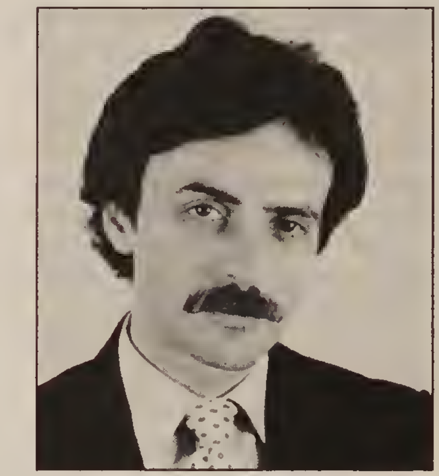
Company	Product	Price	Number of users	Operating system[1]	Recommended system requirements	Availability	Notes
Locus Computing 213-452-2435	Merge 386	$695	2	Not applicable	2M bytes RAM[2], 30M-byte hard disk	Now	
	"	$795	2	AT&T Unix System V, Release 3; IBM PC-DOS; Microsoft MS-DOS 3.1, 3.2	"	"	Priced at $386 through Nov. 30; limit one copy per company
	"	$1,195	Un-limited	Not applicable	"	"	
	"	$1,595	"	Unix System V, Release 3; PC-DOS; MS-DOS 3.1, 3.2	"	"	
Microport Systems 800-722-UNIX; in Calif., 800-822-UNIX	DOS Merge 286	$149	Not available	Unix System V, Release 2	1.5M bytes RAM, 20M-byte hard disk	"	
	DOS Merge 386	$395	2	Unix System V, Release 3; PC-DOS; MS-DOS 3.1, 3.2	2.5M bytes RAM, 30M-byte hard disk	December	Includes Microsoft license at $50
	"	$495	Un-limited	"	"	"	Includes Microsoft license at $150
The Santa Cruz Operation 408-425-7222	SCO VP/IX (386)	$495	2	SCO Xenix 386, MS-DOS 3.2	2M to 4M bytes RAM, 20M-byte hard disk	"	Controlled release
	"	$995	8	"	"	"	"

[1] All products require either Xenix or Unix

[2] Random-access memory

CW CHART

Overall, she says, Microport Unix and SCO Xenix are both very good products. She says SCO is a little more expensive and better documented; with Microport Unix, you have to know a little more about Unix.



Jerry Whetnall

The final, completely debugged version of Microport's DOS Merge 286 began shipping recently, Hill says. It had originally been scheduled for Aug. 15. "It's taken quite a while for a real copy to come out," Hill says. However, for her purposes, OS/2 and its applications are even further off.

For casual end user

At Midland Mutual, long-range planning analyst and self-described pioneer Jerry Whetnall is a beta user of Prime Computer, Inc.'s EXL 316, a 386-based multiuser supermicro that is running on Locus Computing Corp.'s Merge 386 product.

"What I see Merge 386 giving me is all the functionality of Unix," Whetnall says. "What it lets me do is take typical end-user, casual, nontechnical-type people and put them on the machine. They don't really have to know Unix to make the machine work for them, [yet] they're going to get the power of a Unix-based system. "They can get on there and type in DOS and use it just like it's a PC, but they've got the firepower of that Unix operating system backing them up," he adds.

The other thing that Unix provides is Transmission Control Protocol/Internet Protocol communications, which Whetnall says gives him the capability to network into the Prime machine and other hardware.

What matters to Whetnall is not Unix but the hardware independence it affords. In fact, he is not a Unix enthusiast. "I don't have, and I don't think anybody else around here has, that warm fuzzy feeling about Unix. We wouldn't turn it down if the application ran under it, but I don't think we'd actively go out with the intent of saying, 'We want systems that run under Unix.' "

Whetnall still has a problem with Unix and standards. "Our biggest problem with it is, Yeah, OK, there's Unix. But can I get Unix from DEC? No, I get Ultrix from them. And I get Xenix from somebody else. And I get all these different variations.

"Unix, to me, was supposed to be the universal system. We have a fear that Unix isn't truly that way. I'm always going to run into hooks and problems when I try to go from a machine to a machine to a machine," he says.

Nevertheless, Whetnall says he likes what he sees with Merge 386. "It's something I think the DP people can appreciate, but users don't care. They don't want to know what's going on in the background. They don't want to know what system you're running on it. All they want is that the thing runs and it runs quickly. And they want to have the secure feeling that we know what we're doing."

Comparison testing

At AT&T Information Systems Group in Summit, N.J., systems engineer Jason Chang has compared the technical capabilities of the Locus and Microport merge products with those of VP/IX for the 386.

He concludes that the products provide the same basic capabilities: multiuse and multitasking of DOS programs under Unix and Xenix. Chang ran multiple DOS sessions with 1-2-3 in one window and Dbase III in another. He sent Unix mail messages, compiled programs and ran games in other windows.

"Up to eight tasks can be going on at once on your console," he says. "If you're waiting for a Dbase III printout, you can go to another screen and do Lotus work or write a letter — all on the same machine. A 386 can handle it," he adds.

Other options for MIS and PC managers, Chang says, include the ability to access, from DOS, all the Unix file systems mounted on a network. In addition, all the Unix file protection and permissions are inherited, resulting in a secure DOS system.

Chang also successfully ran DOS programs on remote terminals by emulating DOS — but not with graphics. "You can run Lotus 1-2-3 on [Digital Equipment Corp.] VT100s, but you cannot hit F10 and expect a graph to come up," he says.

Chang sees only benefits for PC managers and end users from Unix or Xenix products that allow DOS applications to run under them. "From the DOS point of view, you've inherited all the DOS programs. You get multiuse, multitasking DOS plus all the good stuff of Unix. This addresses not only the casual user but programmers and security-conscious managers," he says.

Goldberg is a free-lance writer based in Amherst, Mass.

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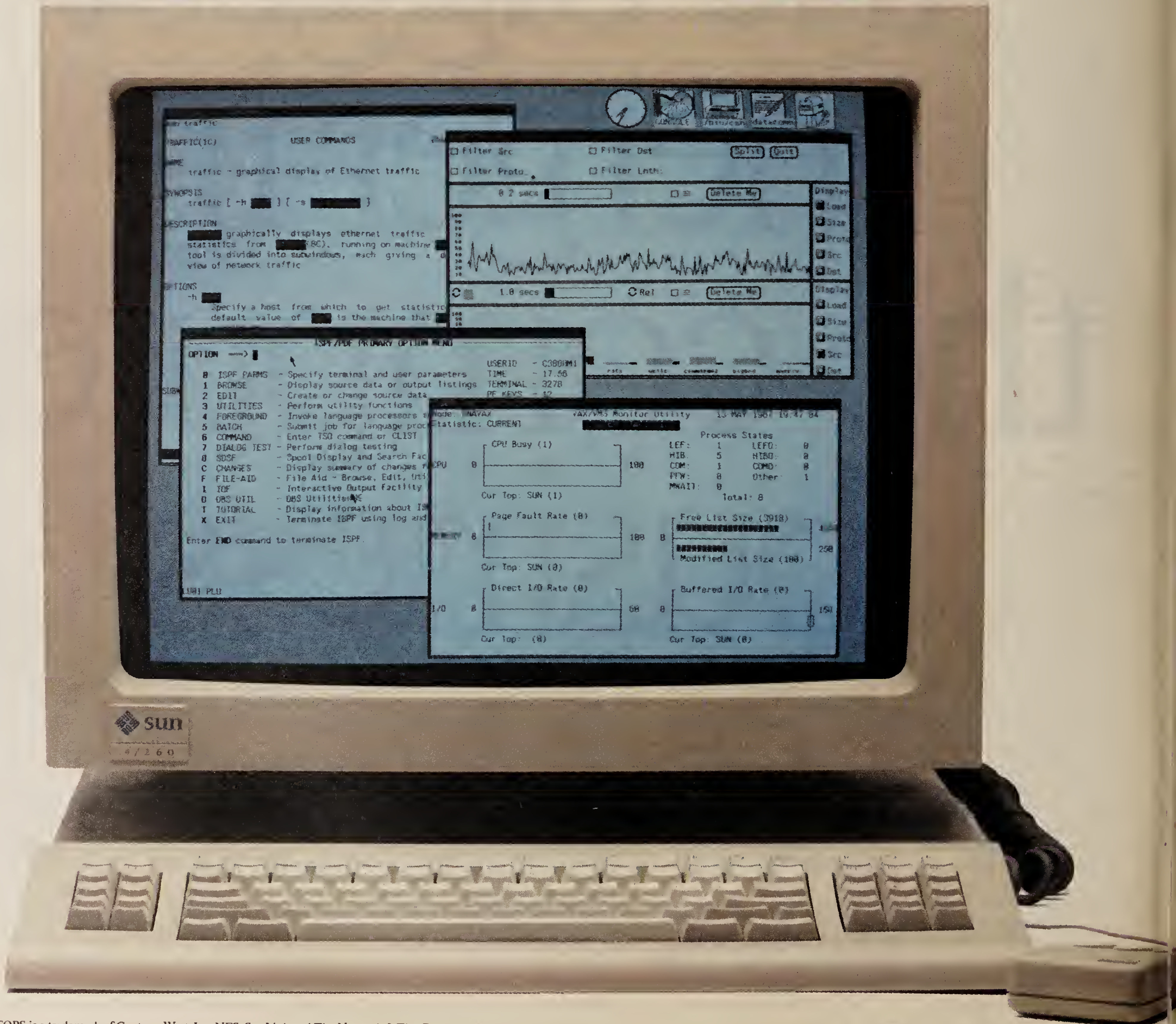

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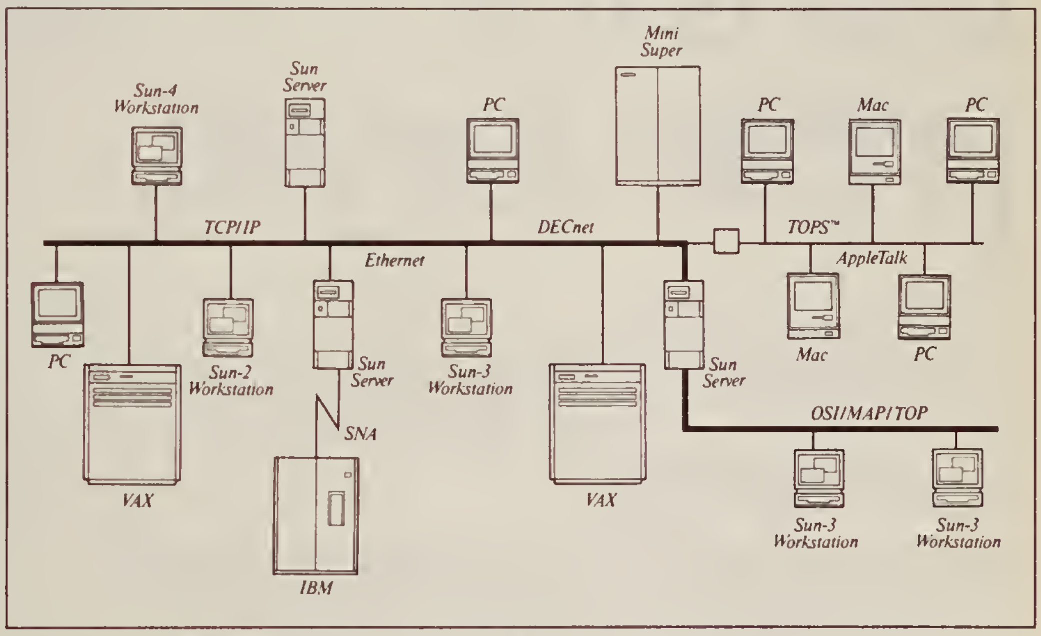

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Zachmann

FROM PAGE 35

sides, they were expensive. I left them for my more adventurous colleagues. Or, at any rate, for those with bigger budgets.

However, Tandy's LP 1000, based on the 6 page/min Ricoh Corp. laser printer engine, is exactly what was needed to bring me into the laser printer age. Sturdy, reliable and supported by Tandy's ubiquitous retail distribution network, the LP 1000 brings a new level of availability and service, as well as a nicely reduced price point from a major vendor, to laser printers.

With an early reputation for decent, low-cost but nonstandard personal computers, Tandy has never been taken seriously by most corporate buyers. Consequently, most corporate buyers are missing out on some excellent opportunities to get great values in well-built, industry-standard micros and peripherals.

The LP 1000 is an excellent example of this. It delivers first-class 300 by 300 dot/in. resolution that stands up well against considerably more expensive units from other vendors.

High reliability

With a mean time between failures rate of 3,000 hours, or 18,000 printed pages , the LP 1000 offers good reliability as well as low cost. And service and supplies are available on a much more extensive basis than even IBM is able to offer.

Setup of the LP 1000 proved to be quite straightforward and trouble-free. I did find, however, that my standard IBM PC-compatible Centronics Data Corp. connector print cables did not work properly with it.

Using them, the printer refused to switch off-line when connected to the computer, even if the computer was off. Once a Tandy cable for the printer was attached, however, everything worked as it was supposed to.

Using the LP 1000 in Laserjet Plus mode, which makes most effective use of the full range of its capabilities, took a little figuring out, since Tandy's documentation is not always as clear as one might like.

Anyway, the bottom line is that thanks to the LP 1000, I've once more overcome my fear of new technology and my anxieties about its reliability. Now I'm hooked forever on laser printers. Before long, I won't remember how I ever got along without one, any more than I can remember what it was like to live without a hard disk. What more could a fellow want?

Zachmann is vice-president of research at International Data Corp.

Cobol tool out for PCs

SAN ANTONIO — As part of its desktop-to-mainframe strategy, Datapoint Corp. recently introduced a product that allows Cobol programs to be developed and debugged on a Microsoft Corp. MS-DOS-based PC.

The Arcnet Personal Network Services VS Cobol Workbench is a Cobol programming environment for micro, mini or mainframe computers. Datapoint said the product will help users cut costs because mainframe-class Cobol programs can be developed and executed on PCs, then recompiled and transported to an IBM mainframe.

The product is based on VS Cobol Workbench, which was developed by Micro Focus in Palo Alto, Calif., and takes advantage of Datapoint's Arcnet PNS PC integration facilities.

While Cobol programs can be developed on a DOS-based PC, they reportedly can be executed by other PCs participating via Arcnet PNS in the Datapoint Resource Management System (RMS) operating system Arcnet local-area network. PC File Access Routine software from Datapoint reportedly extends the networked file system capabilities of RMS to the PC.

The retail price of the product will be less than $4,000, the company said.

Kalok

FROM PAGE 33

The technology became further entrenched when IBM adopted the 3½-in. hard disk as a standard format for its Personal System/2 Models 30 and 50.

IBM is widely expected to enhance its 3½-in. hard-disk offerings early next year.

"The end user pays about $300 for a low-end hard disk and controller now," according to Steven Kaczeus, executive vice-president of engineering and a cofounder of Kalok. "By the end of next year, that should drop to about $150."

Follow the leader

Kalok's intent is to be the lowest price OEM supplier of 3½-in. hard disks, which will "force other companies to follow us," Kaczeus said.

He said the company expects to ship 1,000 drives next month for evaluation and then ramp up manufacturing in Korea to 5,000 disk drives in February, 10,000 in March, 25,000 by next summer and 50,000 by the end of 1988.

Thanks to a manufacturing agreement with Oriental Precision Corp. in Korea and a cost-effective technology design incorporating inexpensive, easily available components, Kalok hopes to cash in on a young and growing market. In addition, Kaczeus brings to the company a reputation for successfully designing low-cost drives, having worked for both Seagate Technology and Lapine Technology, Inc.

Separately, spokesmen for Seagate and Conner Peripherals, which is a strong player in the 3½-in. hard-disk market, declined to specify their firms' pricing plans.

Winchester disk drive prices in the 3½-in. format were forecast to head down in 1988 despite the competitive threat of a start-up company, analysts said, because of the age-old law of supply and demand.

With more demand for the small-form factor emerging, more companies are entering the market. These include Seagate, Maxtor Corp., Control Data Corp. and Micropolis Corp. Manufacturing capacities have increased, bringing the cost per unit down to a level competitive with the older 5¼-in. hard disk drives.

For this year, Disk/Trend, Inc. projected worldwide shipments of 3½-in. hard disks of 30M bytes or less to be 3.5 million, surpassing for the first time the three million 5¼-in. units shipped this year, according to Disk/Trend President James N. Porter.

Some analysts said they believe that a manufacturing and dealer inventory overcapacity of all hard disk drives next year will especially benefit end users, creating a buyer's market.

Osborne

FROM PAGE 35

How did customers react to the Lotus lawsuit?

The corporate market dried up at once. It has come back somewhat, but we haven't seen the same level of antithesis because Lotus is being sued. [SAPC, Inc. is suing Lotus for infringing on the copyright to Visicalc.]

Is there anything new in the suit, or is it just in the discovery phase?

It hasn't even gotten there yet. It is just preliminary motions being heard at the moment.

There is really no point in anyone in our industry filing a lawsuit any longer unless you think you will win it on a preliminary injunction, or unless you are talking about tens of millions of dollars. If you win, your legal fees will probably about match any judgment you may win. And if you win, it will be three to five years after you file the suit before you do. At this point, who cares anymore given the speed at which our industry moves?

Is their motive to influence the market?

To do that is called abuse of process, and that is illegal. Frankly, that is what I think Lotus has been indulging in. That is my personal opinion. I don't personally believe they ever thought the lawsuit would be fought. I don't believe they thought it would go to court. I think the whole purpose of filing the lawsuit was simply to try and scare away competition.

You have always been a champion of low software prices. But instead of going down, prices may go up with OS/2. What do you think will happen with software prices?

In the corporate market, there is virtually no price sensitivity right now because they look at the overall cost of the computer, software and training. The cost of the software is a small piece. Now, nobody is going to be selling 100,000 units a year for quite a while into the OS/2 market because there just aren't going to be that many machines. So for that reason, they have to increase the price to cover the costs for a while.

What areas other than spreadsheets are you interested in?

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Any advice for users or programmers considering entering this business?

Unless you can get a lot of venture capital, don't bother.

What lessons have you learned from the business?

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products can support the DCA and IBM mainframe file transfer software you probably already have installed in TSO, CMS and CICS environments.

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Toshiba card links portable PCs

IRVINE, Calif. — Toshiba America, Inc. claimed last week it will be first to provide networking capability for portable personal computers.

Toshiba's Information Systems Division announced plans to market a network adapter card in early 1988 for its T3100/20 and T5100 portable computers.

The cards are the result of a product development venture with Western Digital Corp.

The $299 network adapters reportedly plug into an internal expansion slot and allow the T3100/20 and T5100 portable PCs to connect directly to a Starlan network, which links multiple PCs in a star arrangement around a central hub or multiple hubs.

Toshiba's AC-powered portables can then be linked to existing Starlan networks or become a subnetwork on other networks.

Users of Toshiba's most recent issue, the T3200, also have the ability to tie into the network. They can reportedly do this by using a standard PC-compatible Starlan card in either of two internal expansion slots.

Toshiba said its Starlan card will be sold with cabling, IBM's Netbios and a driver for Novell, Inc.'s Network operating system.

Scannell

CONTINUED FROM PAGE 33

Some other numbers from the study show that more than 250,000 units will be removed (either sold or scrapped) this year; that 17% of all PCs are on local-area networks, although the number rises to 37% in companies with 1,000 or more employees; that Apple, which owns 19% of the overall PC market, dominates the education and health markets with a 41% share; and that Lotus's 1-2-3 continues to be the most widely used software package, followed by Ashton-Tate's Dbase and Micropro's Wordstar.

From high-tech to no-tech. Until the early 1980s, Centronics Data Computer Corp. dominated the impact printer market the way IBM now dominates PCs. But the company fell on hard times thanks to the Japanese invasion, some technical problems with its own impact products and an inability to deliver nonimpact technology. (Remember the Quietwriter?)

Well, Centronics has slowly backed out of the computer industry during the past year. It has dropped "Computer" from its company name and recently bought a bake ware company, Ecko Group, Inc. In a recent interview in *The Boston Globe,* Centronics President Robert Stein said his firm decided to get into the $24 billion bake ware business because it is everything the computer industry is not: noncyclical and not subject to offshore competition.

For some high-tech companies, I guess, there is more than one way to make some bread.

That ol' Sun River keeps rollin' along. Bill Long, Sun River's president, told us last week that his firm's promising Cygna 386, a fiber-optic workstation, is still on schedule and will go into limited production in the next week or two. He said the company has worked out the last hardware bugs. "Even our most skeptical, conservative and pessimistic engineering people are now confident enough to turn it over to production," Long said. The company recently hired Fred Stansberry away from the The Santa Cruz Operation to be vice-president of sales and brought on Sheila Thurmond as manager of OEM sales. Thurmond has also worked at SCO as well as at AT&T (a company, by the way, that is rumored to be interested — along with Prime Computer — in the Cygna 386).

Thumbs up. Despite the recent palpitations of the stock market, financial investor Montgomery Securities remains optimistic about the chances for micro software during the next few months. The company bases its optimism on its belief in the "productivity and strategic benefits of end-user computing," which users will take advantage of even if a mild economic downturn occurs. Montgomery is recommending that its customers buy Lotus, Autodesk and Corporate Software, with Aldus, Microsoft and Interleaf all rated at hold or as good long-term buys. Montgomery is "fundamentally neutral" on Ashton-Tate.

Brother, can you spare a dime? Speaking of troubled economic times, compatible maker Packard Bell has come up with an aggressive series of financial services for end users. The service plan, which will be sold through retailers, provides same-day credit approval and next-day payment. It also has a warranty that covers repairs for three years on one or many products. Packard Bell's PB386 Supreme is a 16-MHz Intel 80386-based system priced at $4,799 in its basic configuration.

So much for fading away. Computer products never die; they just end up in the hands of liquidators and on television shopping shows. In fact, one *Computerworld* reporter has spotted a Wang Office Assistant for sale on television for about one-third of Wang's asking price.

Scannell is a *Computerworld* senior editor, microcomputing.

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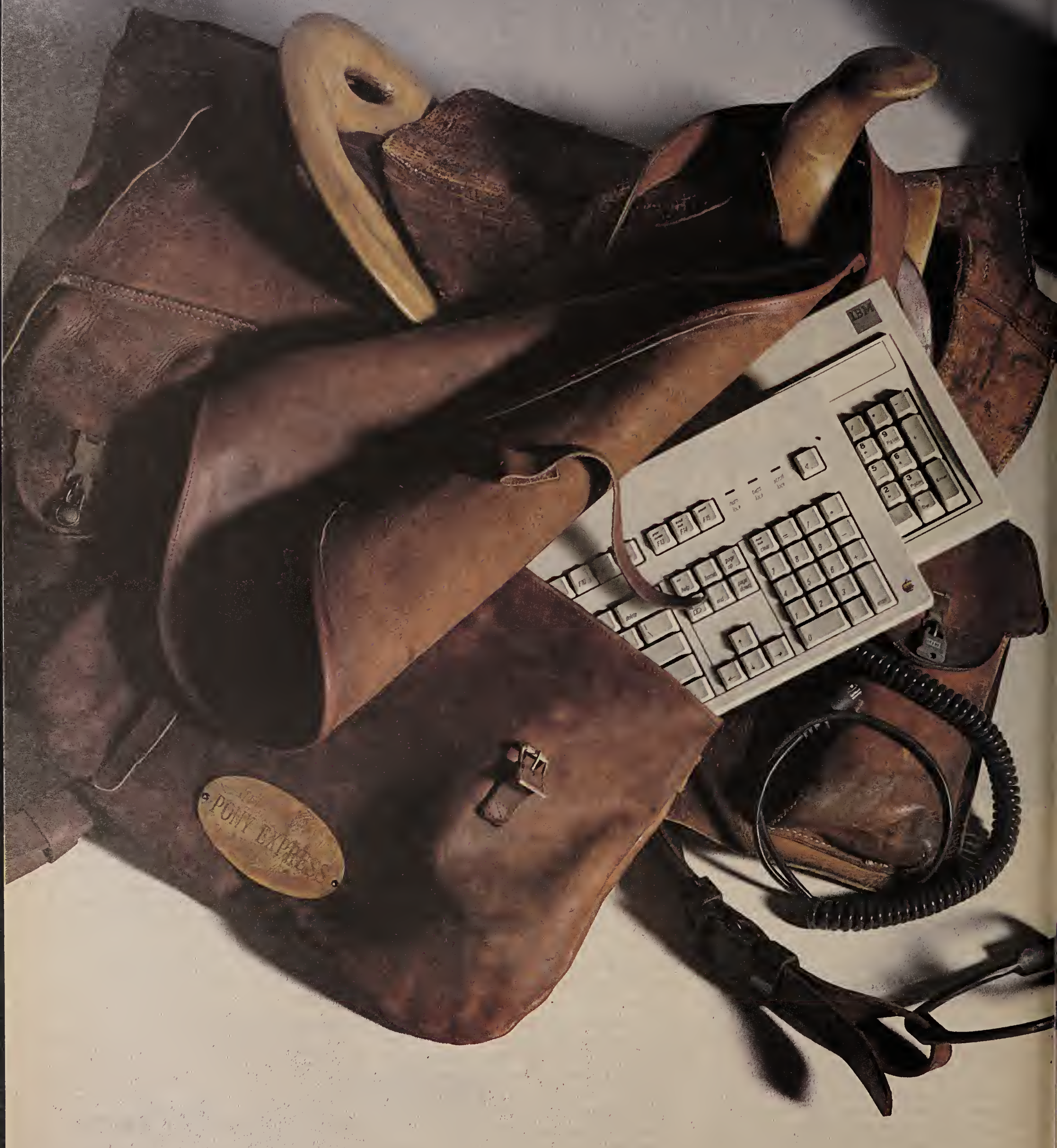

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NETWORKING

NEW PRODUCTS

Systems

A full-color image processing system capable of displaying video, still video, graphics and text simultaneously on a red-green-blue analog monitor has been announced by **IDR, Inc.**

The **IDR Imaging System** is based on the vendor's IDR 386 Workstation, an Intel Corp. 80386-based IBM Personal Computer AT compatible. It also includes the Capture, Merge and Display board, which consists of three Intel 82786 graphics coprocessor chips, each supporting 1M byte of memory; a time-based correction circuit; and an analog-to-digital and digital-to-analog converter.

Other features include more than 16 million colors per pixel; resolution of 668- by 480-pixels; and graphics capabilities such as line and polygon drawing, area fills, block transfers and zoom.

Pricing starts at $9,490.

IDR, P.O. Box 13008, 370 Vanderbilt Motor Pkwy., Hauppauge, N.Y. 11788. 516-434-1900.

Software applications packages

A software package for order entry, order tracking and sales analysis has been announced by **Merle Systems, Inc.**

Called **Orderone**, the software runs in IBM PC-DOS and Microsoft Corp. MS-DOS environments. According to the company, Orderone allows users to retrieve any record out of 400,000 in less than 0.3 seconds. Report generation is provided.

Orderone is available now at $3,500 per license.

Merle Systems, Suite D-10, 160 Mt. Vernon St., Boston, Mass. 02125. 617-282-1846.

Software languages

A version of the **True Basic** language system said to support the Apple Computer, Inc. Macintosh and Macintosh II has been announced by **True Basic, Inc.**

Version 2.0 features enhancements to the True Basic editor, new debugging tools and enhanced speed and modules. It also supports color graphics and the Motorola, Inc. 68881 math coprocessor. According to the vendor, programs written in True Basic on the Macintosh will run on the IBM Personal Computer and compatibles.

True Basic Version 2.0 is priced at $99.95.

True Basic, 39 S. Main St., Hanover, N.H. 03755. 603-643-3882.

Software utilities

JDL, Inc. has introduced an Autodesk, Inc. Autocad device driver for its plotters and printers.

The **Autocad Device Interface** (ADI) direct driver was designed specifically for use with the vendor's JDL-850 EWS 14-color A- to C-size plotter/printer. It is a memory-resident program that features a function said to enable users to automatically plot multiple copies of a drawing.

The ADI direct driver is priced at $195.

JDL, Suite 104, 2801 Townsgate Road, Westlake Village, Calif. 91361. 805-495-3451.

Development tools

Skylights, a software development tool said to allow users to build graphical user interfaces to personal computer-based control systems, has been announced by **The Report Store**, a division of Ergosyst Associates, Inc.

Skylights is a prototyping, construction, maintenance and runtime management tool, according to the vendor. Users can customize screen images using high-resolution color graphics, including bit maps. Support for image grabbing is included.

Skylights is priced from $295 to $750.

The Report Store, Suite 602M, 910 Massachusetts St., Lawrence, Kan. 66044. 913-842-7348.

Software enhancements

Visionics Corp. has enhanced its **EE Designer**, which is integrated computer-aided design and engineering software that was designed for personal computers.

Version 1.7 includes a graphics kernel that has the ability to improve data base management efficiency, according to the vendor.

The product also features user-definable trace widths, pad sizes and D-code settings for Gerber photoplotting in addition to a G-plot function for generating prototype-quality artwork from an Epson America, Inc. or compatible dot matrix printer.

The software also supports orthogonal-snap and double-snap modes for improved schematic routing as well as a multistep pan mode.

It includes a new symbol library with corresponding cross-reference files, the vendor said.

EE Designer Version 1.7 is priced at $995.

Current users may upgrade for $200.

Visionics, 343 Gibraltar Drive, Sunnyvale, Calif. 94089. 408-745-1551.

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- Support for signal handling including program checks and terminal interrupts, and non-standard signals such as timer interrupts and stack overflow
- Many built-in functions including string handling
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And when we combined these features with outstanding technical support and frequent updates—both provided free—software developers everywhere took notice. The SAS/C compiler is now the market leader, installed in hundreds of commercial firms and academic institutions.

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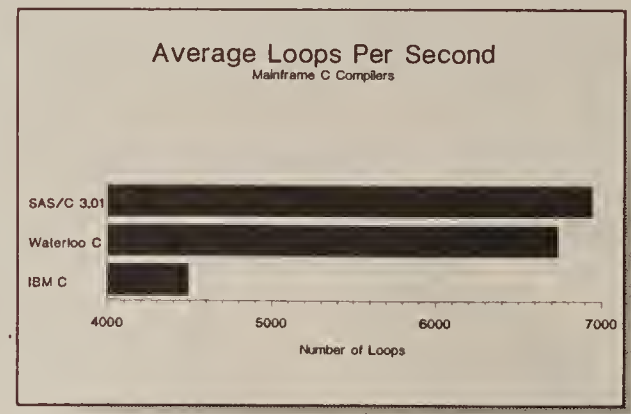

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NETWORKING

DATA STREAM

Elisabeth Horwitt

Model a tool, not a weapon

Let's face it, a lot of the technology we use for business and recreation today was originally developed for aggressive purposes. Unfortunately, a product's potential business uses may be overlooked if it is presented to the world as a competitive weapon.

Such could be the case for a network cost allocation model jointly developed by MIT's Sloan School of Management assistant professor Michael Treacy and the Index Group, a Cambridge, Mass., research firm.

The researchers designed the model to help MIS managers more effectively trim the costs of existing network installations and to make buying decisions on the basis of long-term operation expenses as well as initial acquisition costs. But the model was introduced to the world as new ammunition in DEC's war to prove that its own networks are less expensive to run than IBM's.

DEC's offer to fund a multisite study based on the model must have seemed a godsend to the researchers, who had just completed the initial working version and needed a way to test it in real business settings. Besides giving them a chance to do this, the study provided some interesting data about network cost breakdowns over a five-year period.

Continued on page 58

IBM protocols rule the roost in U.S. offices

BY ELISABETH HORWITT
CW STAFF

IBM's Distributed Office Support System (Disoss), Systems Network Architecture Distribution Services (SNADS) and Professional Office System are currently performing the role of de facto industry standards for the host-based office automation market, according to a recent report by International Data Corp. (IDC).

"IBM is . . . the only vendor that can successfully develop its own proprietary data communications standards and have them accepted in large U.S. organizations," the Framingham, Mass.-based research firm claimed. There are approximately 32,000 Systems Network Architecture licenses worldwide, the report estimated.

In the past couple of years, IBM's office automation protocols have become part of the product lines of all of its chief rivals in the office automation field, namely Data General Corp., Digital Equipment Corp., Hewlett-Packard Co. and Wang

Continued on page 57

IBM's connectivity

Products that enjoy support of computer rivals' backing still lack Enhanced Connectivity Facility, Distributed Data Manager

	Vendor			
Connection	Data General	DEC	Hewlett-Packard	Wang
3270 Systems Network Architecture	S[1]	S	S	S
LU6.2	S	S	S	S
Distributed Office Support System	S	S	S	S
Document Content Architecture	S	S	S	S
Library services	S	S	S	S
Distribution services	S	S	S	S
SNADS[2]	S	A	—	I
Professional Office System	A	A	S	S
Token-Ring network	—	—	—	I
Enhanced Connectivity Facility	No current support			
Distributed Data Manager	No current support			

[1] S: Shipping
A: Announced
I: Statement of intention issued

[2] Systems Network Architecture Distribution Services

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Banks cash in on EDI

Study projects go-between role in business deals

BY MITCH BETTS
CW STAFF

Corporations that use electronic data interchange (EDI), which is becoming the preferred method of conducting business in several U.S. industries, expect their commercial banks to play a role in EDI transactions.

That conclusion, based on a recent study funded by 12 major banks, suggests the time is ripe for banks to start providing EDI services for their corporate customers. Otherwise, they risk losing their role as intermediaries for corporate financial transactions, analysts said.

"This tells banks that if they want to stay in the corporate payments processing game at all, they have to take EDI into consideration," said Jack Shaw, president of EDI Strategies, Inc., a consulting firm in Marietta, Ga.

More aggressive banks can use EDI to deliver a variety of cash-management services and other information services, Shaw said.

The study, coordinated by Coopers & Lybrand, an accounting and consulting firm in Chicago, was intended to help the banks stake out their positions as vendors in the growing EDI market. That market uses the ANSI X.12 standard to exchange orders, invoices and other intercorporate transactions [CW, Aug. 10].

Assisting with the research, including interviews with data processing and financial executives at 400 corporations, were

Continued on page 52

Arco powers Ethernet to 500 nodes

BY KATHY CHIN LEONG
CW STAFF

LOS ANGELES — In 1980, when most corporations were beginning to install personal computers, oil giant Atlantic Richfield Co. (Arco) was investigating ways to network them. Today, with 500 nodes attached to a single Ethernet local-area network, Arco is an example of an enterprising user taking advantage of new technologies without scrapping the old.

An eclectic array of workstations and terminals coexist on one network, spanning 15 floors of the 51-story Arco headquarters building here, using a variety of wiring schemes.

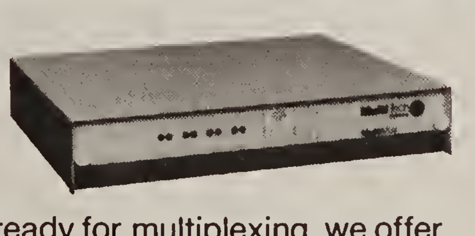
"What they have set up is an unusually large network," says Nina Burns, an analyst at Infonetics, Inc., a Santa Clara, Calif.-based market research firm. "The average company using Ethernet has about 10 nodes."

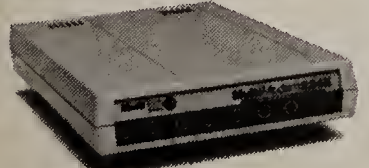
Alan Brittner, Arco's manager of system services for corporate headquarters, notes that Arco was one of the orginal beta-

Continued on page 57

Inside

- Netwise tools aimed at reducing time, costs of software development. Page 52.
- Orchid Technology announces Micro Channel-compatible LAN card. Page 62.
- Gould releases fiber-optic multiplexer. Page 64.





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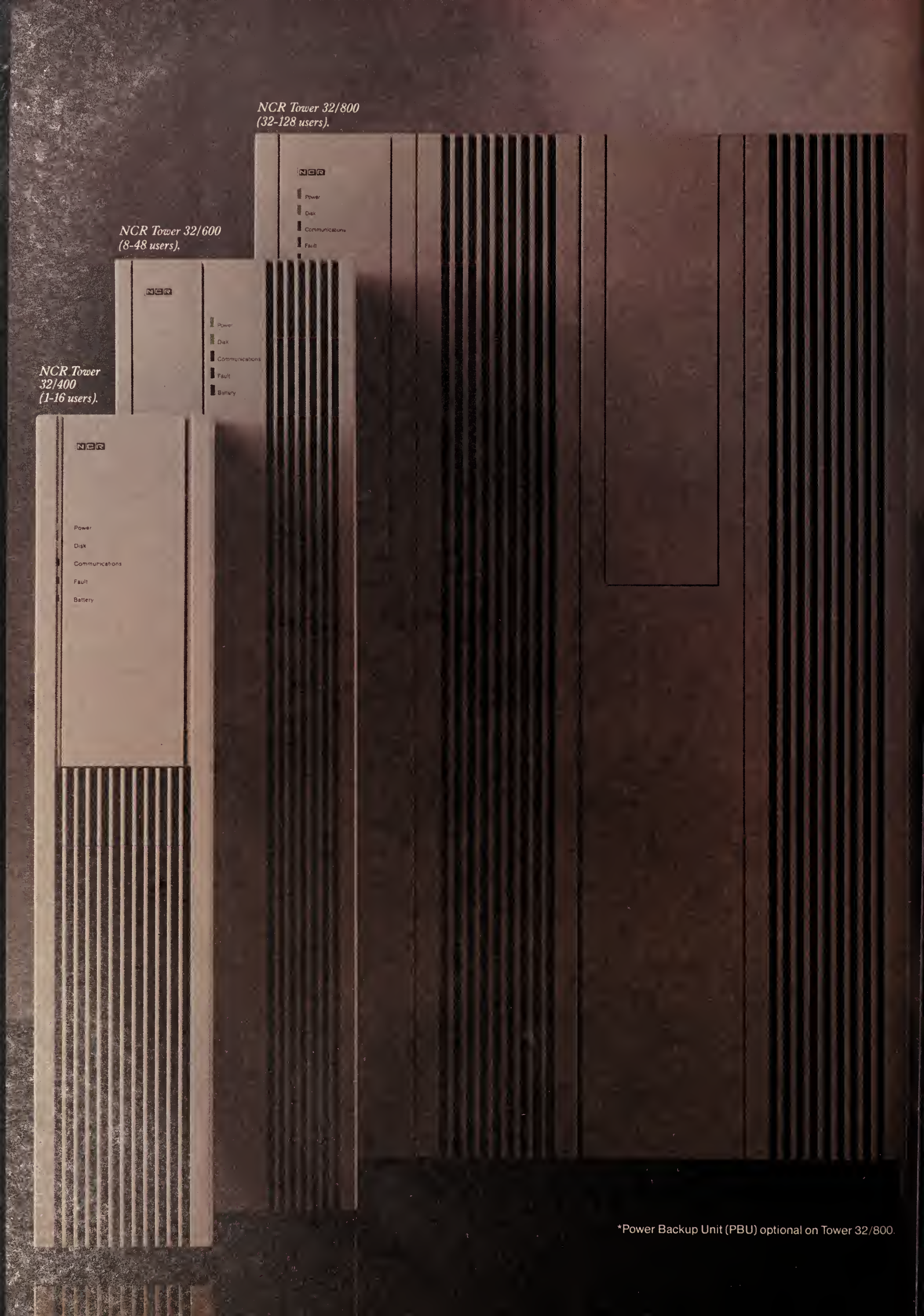

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Tools generate standards-based net software

BY PATRICIA KEEFE
CW STAFF

BOULDER, Colo. — Netwise, Inc., an independent developer, has introduced a family of modular software tools said to reduce the time and costs associated with developing and maintaining portable communications software.

The Netwise Tools family is said to automatically generate standards-based network software for communications or distributed applications.

Netwise Tools is an Open Systems Interconnect (OSI) standards-based alternative to proprietary software products on the market today, the vendor claimed.

Tools produces OSI source code that can be adapted to work in other commercial-standard environments, such as IBM's Systems Network Architecture or Digital Equipment Corp.'s Decnet. Tools also conforms to the International Standards Organization/Draft International Standard 8824 and 8825. The source code is operating system-, hardware- and network-independent.

The Tools family includes the following:

- Protocol Data Unit (PDU) compilers, which create procedures to encode and decode data.
- Network Libraries, which provide a network-independent interface for developing applications.
- Remote Procedure Call (RPC) compilers, which create source code to allow distribution of applications across a network using remote procedure calls.
- ASN.1 Translators, which create procedures to encode and decode data described by ISO ASN.1 specifications.

Speaking many tongues

Versions of the PDU and RPC compilers that accept declarations and generate source code in C, Fortran, Cobol and Ada will be offered. The Network Libraries will provide a consistent interface, supporting IBM's OS/2, OSI Manufacturing Automation Protocol, Decnet, SNA Advanced Program-to-Program Communications, Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Netware and IBM's PC LAN Program software.

The software can run on hardware ranging from personal computers to supercomputers, the vendor said.

Most modules of the Tools family are available on Convex Computer Corp., Silicon Graphics, Inc., Sun Microsystems, Inc., Cray Research, Inc. and ELXSI Co. machines as well as IBM's 4381 and PC and DEC's VAX. Support for other brands reportedly will be available in the first three quarters of 1988.

The PDU compilers are priced per CPU for development licenses, and additional run-time licenses are necessary for distribution. PDU compiler prices range from $1,800 for the IBM PC to $60,000 for Cray supers. RPC compiler prices range from $1,500 for the IBM PC to $48,000 for the Cray machine.

Banks

CONTINUED FROM PAGE 49

EDI Strategies and the Bank Administration Institute in Rolling Meadows, Ill.

Companies are expanding their EDI activities from purchase-order and invoice transactions to include corporate electronic payments, the survey showed. Furthermore, those corporations already using EDI expect their commercial banks to handle the related electronic financial transactions.

"Companies want the convenience of handling the electronic funds transfer and the payment remittance details in a single transaction," the study noted.

The report also addressed the positive and negative experiences of those companies that were the first to employ EDI four or five years ago.

They "gained significant strategic advantages with trading partners, but they also made large investments in customized application software and proprietary communication networks," the study said.

On the other hand, companies just starting out in EDI will find it less costly because they now have the option of purchasing standard translation software and can use third-party networks, the researchers said.

The survey showed that more than half of those using third-party networks have chosen one of three leading vendors: GE Information Services, a division of General Electric Co.; McDonnell Douglas EDI Systems Co.; and Ordernet Services, a division of Sterling Software, Inc.

The biggest costs for building and operating EDI systems are software development, coordination with trading partners, retraining clerical personnel and network communications fees, the study found.

"Few companies have fully recovered their investments in EDI yet; but most expect to break even, at least, within three to five years," the study said.

The primary benefits cited by present EDI users are the reduced paper processing costs and delays; reduced error and correction processing costs; reduced inventory levels and receivables disputes; and improved relations with trading partners.

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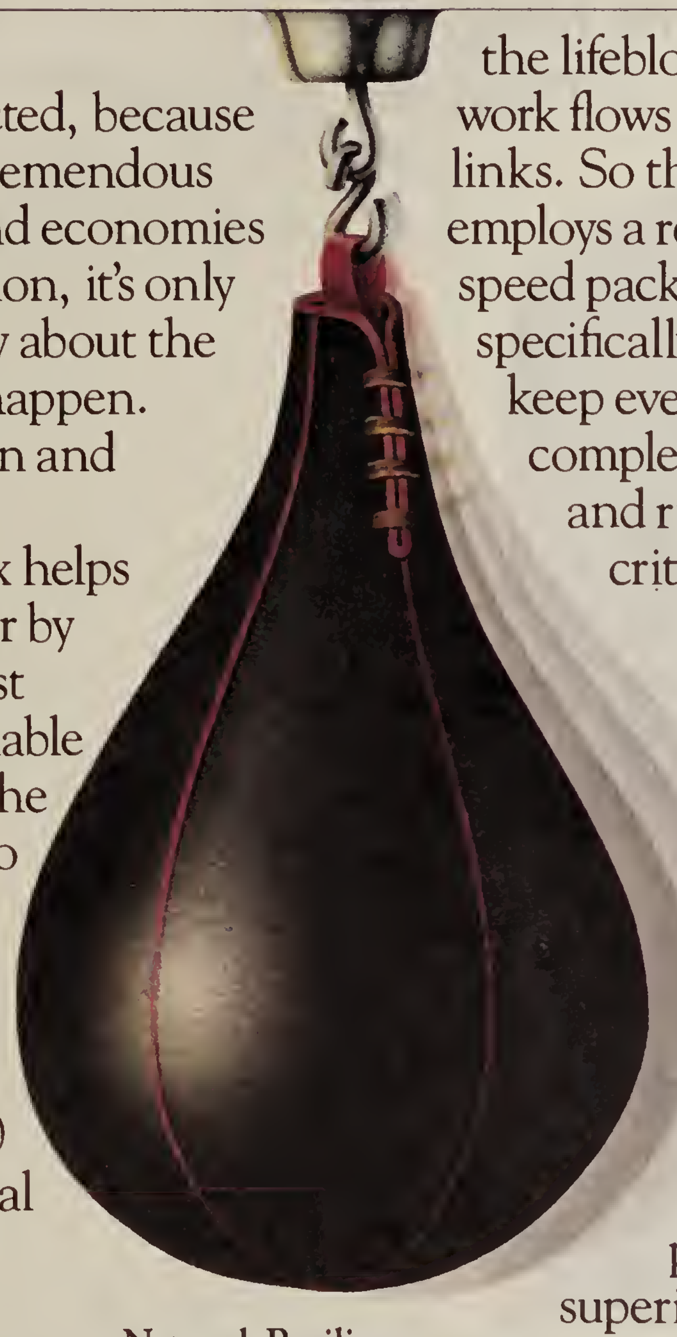

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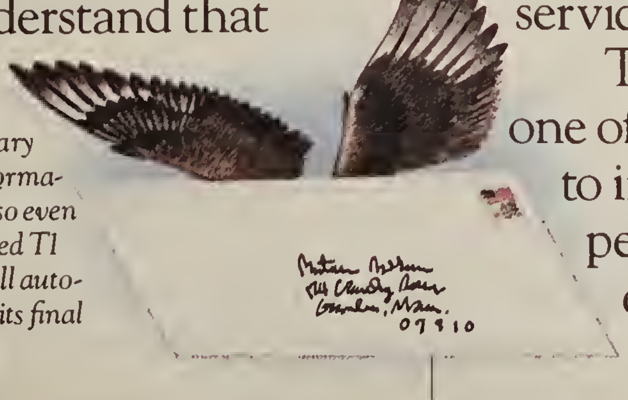

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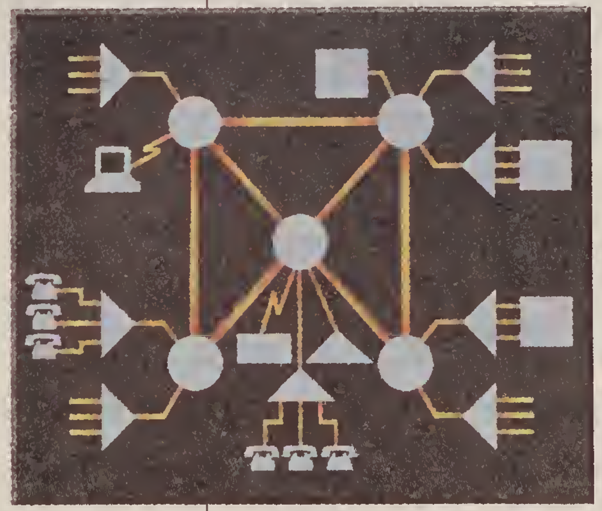

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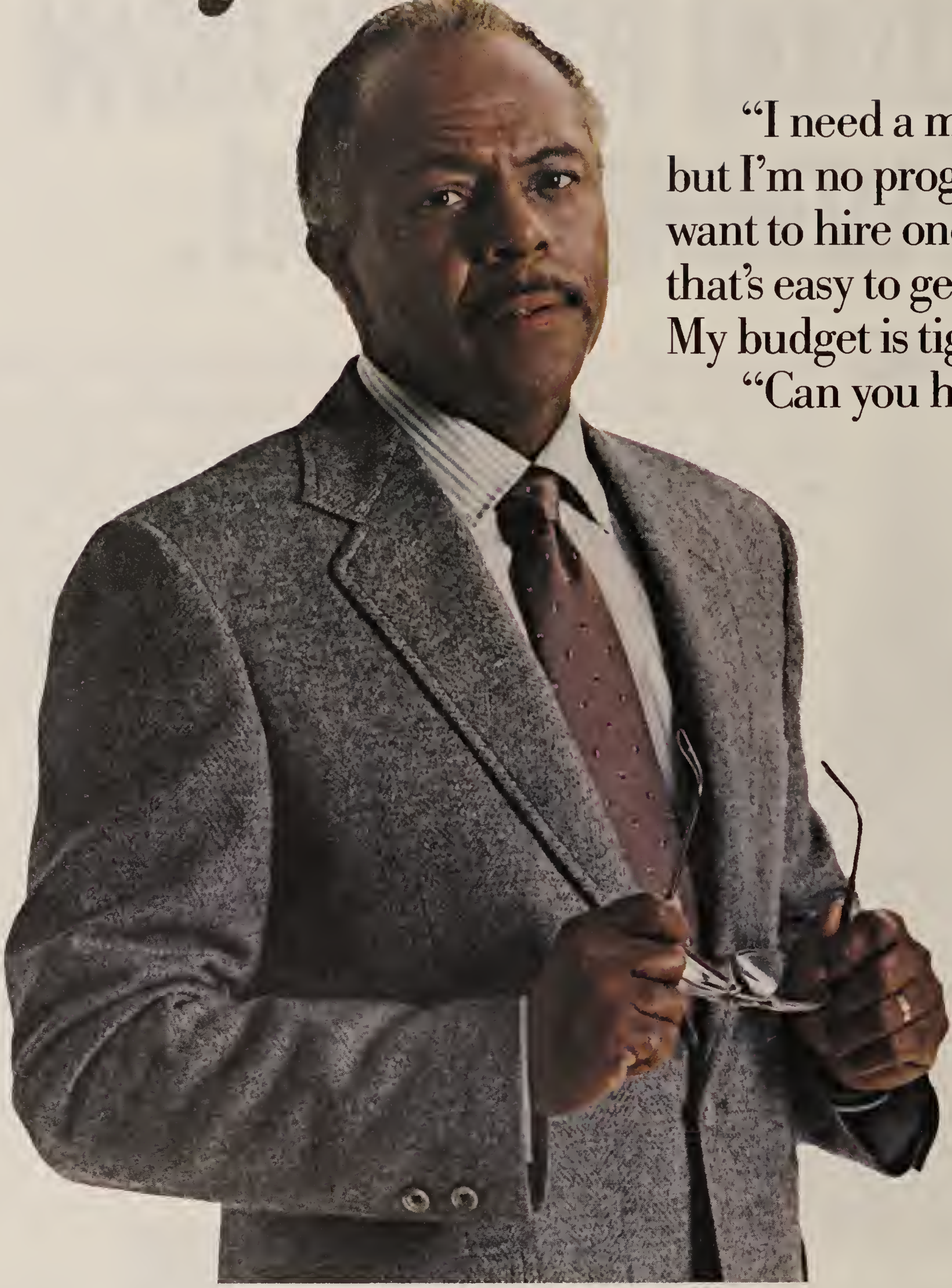

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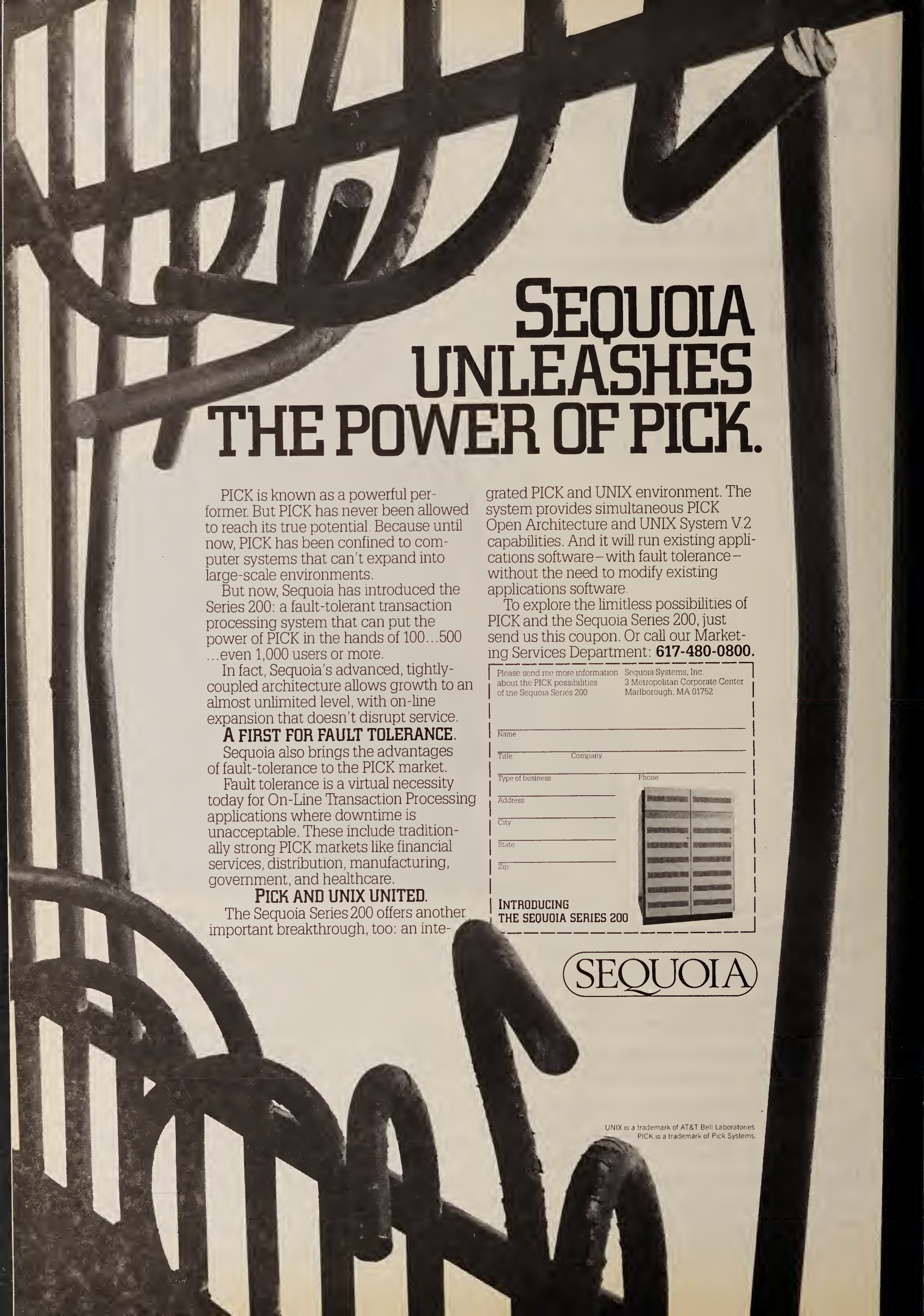

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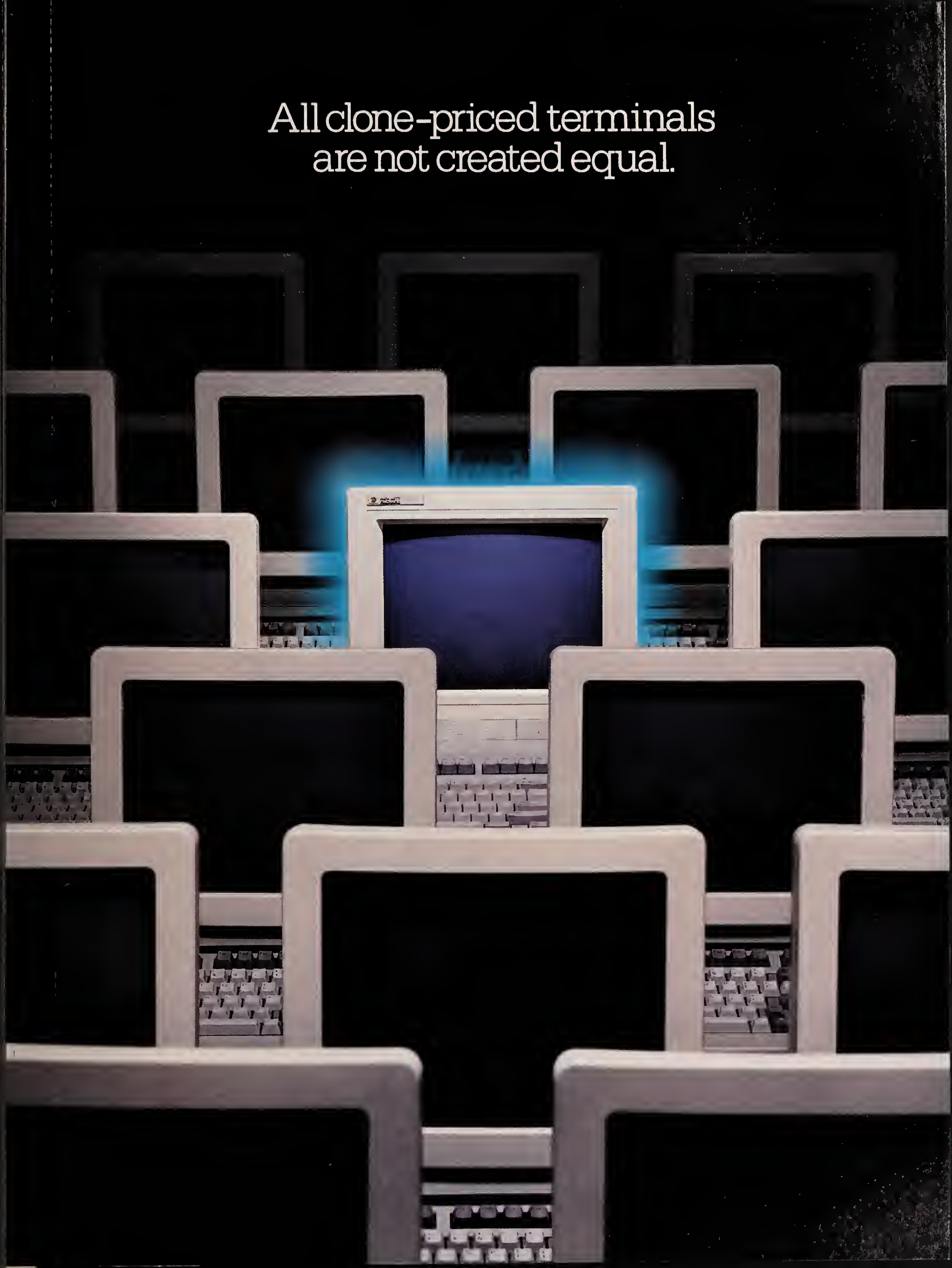

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National language layouts available

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TeleVideo 905, 910+ and 925E products of TeleVideo Systems, Inc.
ADM 3A and ADM5 products of Lear Siegler Corp
Hazeltine 1500 product of Esprit Systems, Inc.
ADDS Viewpoint AZ product of Applied Digital Data Systems, Inc
QUME QVT-101 product of Qume Corp

For more information, call
1 800 752-0900, Dept. 283C.

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T BLAST

GE ties E-mail, All-In-1; SNA Gate revamped

E Information Services, a
vision of General Electric Co.
sed in Rockville, Md., has an-
unced a new application said
allow the exchange of docu-
ents between subscribers to
Quik-Comm electronic mail
rvice and users of Digital
uipment Corp.'s All-In-1. The
rvice provides a connection
tween All-In-1 sites and recip-
nts on IBM Personal Comput-
s, teletype terminals, telex
stems and IBM's Professional
fice System and Distributed
fice Support System. Prices
r the Quik-Comm to All-In-1
plication range from 35 cents
r a note up to 300 characters
ng to $1 for the first page of a
cument.

Also announced was Version 4.0 of the company's Personal Computer Mailbox software, which is said to offer easier installation, expanded addressing functions, an option to automatically print incoming messages and more comprehensive status reports.

Netlink, Inc. in Raleigh, N.C., has announced Release 1.7 of the 3703 SNA Gate for IBM's Systems Network Architecture. New hardware and software components in the release are said to provide enhancements including access to multiple LU6.2 and PU2.1 sessions; expanded graphics support, particularly of SAS Institute, Inc.'s software package; support of Tektronix, Inc. emulators in Apple Computer, Inc. Macintoshes and other personal computers; and support of attached printers and PCs emulating remote job entry workstations. Available now, pricing for the release starts at $4,000 for an eight-port unit. Existing SNA Gate users can upgrade their units for a one-time charge of $200.

Bridge Communications, Inc. in Mountain View, Calif., a division of 3Com Corp., has introduced a personal computer network management server for local-area networks supporting Xerox Network Systems (XNS) protocols. The Network Control Server (NCS)/AT-XNS reportedly maintains a system audit trail that logs all network activity while also monitoring critical network parameters in both real-time and graphics form. The product is based on an IBM Personal Computer AT running Xenix with a 40M-byte hard disk. Available now, the NCS/AT-XNS is priced at $12,900, including the PC.

Pritronix, Inc. in Dallas has signed a two-year contract with MCI Communications Corp. for maintenance and support of MCI's personal computer systems nationwide.

American Research Corp. has signed a letter of intent to purchase up to 10,000 local-area networks with a projected value of $7 million from **10-NET Communications, Inc.**, formerly Fox Research, Inc., in Dayton, Ohio. American Research will market the network under its own brand name, ARC-lan, and will sell it in a three-node base configuration with additional workstations and file servers available optionally.

DA Systems, Inc. in Campbell, Calif., and **Geonet Mailbox Systems** in Alexandria, Pa., have agreed to provide electronic mail exchange between their user bases. Geonet provides E-mail links to more than 10,000 users of the worldwide Geomail Association, as well as facsimile delivery. DA Systems' Dasnet service provides links to a variety of messaging products and services, including AT&T Mail, MCI Communications Corp. Mail and Western Union Telegraph Co. Easylink.

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rco powers

ROM PAGE 49

st sites for the Xerox Corp.
hernet network seven years
o. "We had one central net-
ork then, and that included 20
erox Star workstations and Xe-
x 860 processors," he says.

At the time, the network was
rictly an experimental scheme
ncentrated in the employee
lations department. Users in
at department needed to net-
ork the Xerox workstations
d high-speed Xerox laser
inters for documents such as
e corporate organizational
art and other company litera-
re. The year-long pilot pro-
am saved the company 37% in
nual service costs.

Before the network was in-
alled, the staff typically used
aphic arts and professional
ord processing services. Hav-
g the same services performed
ternally resulted in reducing
e turnaround time from weeks
days. "We found the network extremely helpful, and the attractive rate of return was a great example to show to management," Brittner says.

Over the years, the department has also been able to handle the same tasks with fewer employees. The success enjoyed by the employee relations department spurred other divisions at Arco to follow their example by installing similar LANs.

About two years ago, Arco started to phase in 3Com Corp. Ethernet technology. Today, Arco's network is 90% 3Com.

Wide LAN use

Other corporate users who are finding applications for the LAN include analysts, financial planners, auditors, tax preparers and public affairs employees. Brittner estimates that 900 of the 1,200 office workers based at Arco's corporate headquarters are taking advantage of the network.

Although Arco is a multimillion dollar corporation, keeping an eye on costs is still a must.

Alan Brittner

Instead of outgrowing its single Ethernet LAN, the firm has found more and more uses for that technology, which now supports more than 10 3Com Corp. file servers and 1,000 other devices, including 500 IBM PCs, Apple Computer, Inc. Macintoshes, Xerox Star computers and dial-in dumb terminals.

Employees in the field are able to tap into the 3Com network using the remote dial-in features on Tandy Corp. and Hewlett-Packard Co. portable computers, Brittner says.

Last year, in a move to prepare for future networking technology, Arco installed Lattisnet concentrators from Synoptics, Inc. in Mountain View, Calif. Lattisnet allows a variety of wiring schemes to operate on Ethernet rather than just the traditional coaxial cable.

Synoptics helped Arco install Ethernet Type 1 IBM cable across each of the 15 floors, tying in unshielded twisted-pair wiring for IBM 3270-type terminals and shielded twisted-pair wiring for workstations. Brittner, together with the telecommunications department, decided to use fiber-optic cable as a backbone to link the Type 1 cable between the floors.

"We want to be prepared for the future standard wiring scheme, whatever that may be," Brittner says. "We didn't just jump into this. It was all tested very thoroughly, so we didn't feel we were taking a gamble."

Today, the different cabling media are performing as if there were just one type on the network. Brittner reports no performance degradation. With the physical connections in place, the department has time to focus on applications.

Because Brittner's department has yet to find true networking applications that will meet its stringent standards, employees continue to use single-user off-the-shelf microcomputer software as well as vertical-market applications.

But there are exceptions. The tax department has found a LAN version of a tax preparation package, and the aviation department uses LAN software designed for aviation management.

As far as Brittner is concerned, the network will never be completely finished. "There's no reason why we wouldn't grow our network to be even larger," he says. "We have ways of splitting the network logically. As we get into more complex workstations and graphics applications, we will be ready to migrate [to other network schemes] when necessary."

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rotocols

ROM PAGE 49

aboratories, Inc.

Third-party vendors such as
oft-Switch, Inc., Rabbit Soft-
are Corp. and Communications
olutions, Inc. have helped users
d vendors implement IBM's
otocols on new systems. Sup-
ort for IBM's protocols will
ontinue to grow in 1988, IDC
edicted.

he complementary trio

mong the most established of
M's office system protocols
e three complementary prod-
ts: Disoss, DIA/DCA and
NADS.

Disoss is a mainframe soft-
are package running under
ICS that keeps track of net-
ork nodes and resources through a directory so that documents can be routed to the right destination. It is also one of two IBM software products that run with SNADS. The other is Personal Services, which incorporates DCA.

However, Disoss has some drawbacks, according to IDC. It has been described as "user-vicious" and reportedly carries a large mainframe overhead. And unlike competing products from Wang and DEC, Disoss is said to lack key functionality such as the ability to support graphics, data base management systems, spreadsheets and documents with embedded formatting.

SNADS provides the transport mechanism by which documents are passed from one node to another in a store-and-forward fashion. It may eventually become a more generalized data transport system that will support graphics, software and data bases and documents, IDC predicted. SNADS can be used without Disoss or Personal Services.

DIA/DCA defines the way in which a document is formatted and packaged for sending.

Future applications

In the 1988 to 1990 time frame, IDC predicted, IBM will announce additional document formats for DCA, including graphics, image, voice and compound documents.

In the future, vendors will use the above protocols to communicate not only with IBM but also with each other, the report claimed. Recently announced IBM protocols — such as Systems Application Architecture (SAA), Enhanced Connectivity Facility (ECF) and Distributed Data Management — are just beginning to garner multivendor support.

However, ECF only began shipping in the fall, and SAA is still a long way from being fully defined and documented. IDC predicted it will be three years before the first third-party SAA packages are announced.

In contrast to their almost uniform implementation of IBM office automation protocols, the leading computer vendors have only just begun to support the OSI X.400 document-exchange protocol, IDC found.

While DEC now delivers X.400 in the U.S. and HP is about to, others have announced but not shipped X.400 implementations. IBM has announced X.400 products in Europe but not in the U.S.

The OSI electronic mail standard is still limited in functionality as well as in multivendor support. It provides no conversion facilities beyond simple ASCII text, which means that documents transferred between different office automation systems will lose their formatting. Also missing from the OSI standard is a common directory component to allow documents to be routed across different E-mail systems and services to the intended destination.

A more mature X.400 has the potential to impact a larger user and vendor base than do the proprietary IBM protocols that perform the same function, according to IDC. However, it is likely that both IBM protocols and X.400 will play major roles in multivendor document transfer for at least the next 10 years, the report stated.

Xyplex adds VAX-to-terminal server

CONCORD, Mass. — Challenging Digital Equipment Corp. on its own turf, Xyplex, Inc. has announced a communications server said to provide uninterrupted connections between terminals and DEC VAX hosts over local and wide-area links.

The Maxserver 5000 supports up to 15 eight-port server cards and 480 simultaneous sessions, the vendor said.

Different types of server cards connect IBM Personal Computers, printers, modems and host computers over an Ethernet local-area network or long-distance link, Xyplex said. The wide-area networking interface supports 1.5M bit/sec. T1 connections.

The server's multiprocessor architecture is said to provide automatic backup so that if one card fails, another automatically takes over the group of ports. A redundant power supply is also available.

The Maxserver 5000 is controlled by Xyplex's Advanced Network Management software, which performs configuration, control and diagnosis across local and wide-area links, the vendor said.

The Maxserver 5000 costs $9,995. A server configured for 120 ports costs less than $250 per port, according to Xyplex. Eight-port terminal server cards are priced at $1,295. Commercial shipment is scheduled to begin in January.

Horwitt

CONTINUED FROM PAGE 49

When DEC released the results, it gave fair play to the model's overall utility. Nevertheless, as the basis for DEC's attack on its archrival, the model risked losing some credibility as a network manager's tool. Users of other vendors' networks — IBM customers especially — may dismiss the tool as DEC-biased.

That would be a real shame; network managers need all the help they can get when it comes to cost control. The initial results of the study, when taken across all sites, contain some real shockers that could radically change the way managers go about pinpointing the sources of network budget overruns.

The model analyzes networks not just on their affordability but also on how functional, flexible and manageable they are. Different types of networks are rated by different criteria: For example, backbone bandwidth would be a major consideration for a corporate network, while a local-area network would be judged on what kinds of capabilities it delivered to the desktop. Flexibility-related characteristics include transmission options, stability under change and intervendor standards. Manageability criteria include security, maintainability and connect/disconnect management.

Costs are analyzed through a 15-square grid. Equipment, software, personnel, communications carrier services and facilities (wiring, space and so on) are on one axis. On the other are the three stages of the network: initial acquisition, operation and incremental changes and additions of users and equipment.

Obviously, the only way to achieve a meaningful cost comparison of two vendors' network sites is to ensure equivalency in terms of functionality, flexibility and manageability; otherwise, we have an apples-and-oranges situation. This is difficult to do with a 17-site study, which leaves the results open to question.

On the other hand, any firm can use the model to gain some important insight on where its network costs are coming from. The DEC-funded study also provided some valuable data about the areas in which those costs are likely to fall.

Lending weight to the overall cost breakdown is the fact that the numbers stayed pretty consistent across all 17 sites, whether the network linked the whole corporation, a group of field sites or a manufacturing installation — no matter whose equipment was being used.

One of the biggest surprises, according to MIT's Treacy, was the comparatively small portion of network costs taken up by initial acquisition of equipment and software. Total acquisition costs averaged out to less than one-third of the five-year networking costs across the 17 sites.

These results should be taken to heart by MIS managers who concentrate on initial equipment costs when they compare different vendors' responses with their requests for proposals.

One possibility is for firms to insist that bidders use the model to project operations and incremental change costs for their systems for a five-year period and incorporate the results into their proposals.

In contrast, personnel outlay plays a major role in overall expenses: 50.5% in manufacturing sites and approximately 30% for the other two types of networks. This is where DEC takes up its cudgels, claiming that its networks are cheaper to run because they require less "personal intervention" than do IBM's networks.

Rather than get embroiled in that debate, may we suggest that companies start concentrating their cost-cutting campaigns on personnel issues? Several emerging network management products and technologies, particularly in the decision-support and expert system areas, could make it possible to get along with fewer people — particularly lavishly salaried, hard-to-find, hard-to-hold technical experts.

Horwitt is a *Computerworld* senior editor, networking.

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The ability to perform capacity planning, and the use of PF keys to drive the system, were other benefits noted by these respondents. Low cost, ease of use, and low resource utilization were candidates for high honors on the lists of many of these users.

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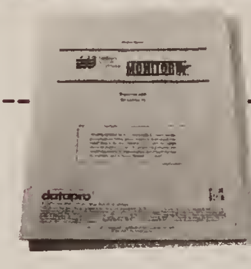

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NEW PRODUCTS

Local-area network hardware

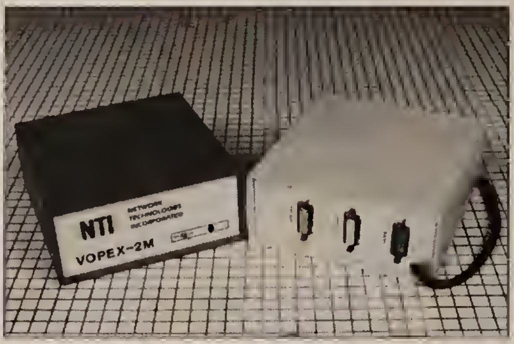
Orchid Technology, Inc. has added **PCnet-2**, an IBM Micro Channel-compatible local-area network card, to its line of networking products.

PCnet-2 is said to provide IBM Personal System/2 Models 50 and 60 with LAN capabilities. It offers such Micro Channel bus-specific features as position option select, burst mode direct-memory addressing and shared interrupts.

Other features include a distributed bus topology transmitted through a CATV baseband coaxial cable up to a maximum of 7,000 ft between nodes. Data is accessed at 1M bit/sec., the vendor said.

PCnet-2 is compatible with IBM PC-DOS 3.3, Orchid's Netbios and PCnet/Advanced Netware. It costs $495 per card.

Orchid Technology, 45365 Northport Loop W., Fremont, Calif. 94538. 415-683-0300.



The Vopex-2M *port expander*

The **Vopex-2M** two-channel video output port expander, said to permit building of video local-area networks based on Apple Computer, Inc.'s Macintosh II, has been announced by **Network Technologies, Inc.**

The video LANs consist of a single Mac II driving two or more monitors located up to 100 ft from the computer. The Vopex-2M port expander buffers, amplifies and rebroadcasts the computer output.

The Vopex-2M is priced at $279.

Network Technologies, 19145 Elizabeth St., Aurora, Ohio 44202. 216-543-1646.

Network management

A Digital Equipment Corp. VAX-based management information and control system has been announced by **Develcon, Inc.** for use with its Develnet networking data private branch exchange.

Called the **Management Information Center** (MIC) **III**, the system features a multicolor graphic display of current network status. It also provides planning and management tools, including reports for such functions as billing, general subscriber activity, link performance and subscriber connection.

MIC III supports multitasking as well as functions inherent in Develnet, the vendor said.

Available in three versions, MIC III costs $10,000 for up to eight nodes, $25,000 for up to 16 nodes and $50,000 for up to 64 nodes.

Develcon, 6701 Sierra Court, Dublin, Calif. 94568. 415-829-6200.

Customer-premise equipment

A store-and-forward-message and document switching system, the **NET/X-2000**, has been introduced by **ITS Equipment and Leasing Corp.**

Built around the Intel Corp. 80286 microprocessor and communications coprocessor, a single desktop system can be expanded to up to 32 user ports and two trunk line ports in a redundant configuration with a crossover switch and corresponding software.

When used as a gateway, the vendor said, the NET/X-2000 supports CCITT X.25 with speeds of up to 56K bit/sec.

The desktop version with eight ports, a console CRT and a printer costs $8,500. A fully redundant system with 32 user ports, two X.25 trunk ports and a crossover switch costs $40,000 to $45,000, depending on the protocol used.

ITS Equipment and Leasing, 45 Orville Drive, Bohemia, N.Y. 11716. 516-589-8666.

Links

Communications software for IBM batch Binary Synchronous Communication data has been announced by **Software Results Corp.**

The software is said to allow the vendor's 3780/VMS Comboard to interconnect to the IBM System/38. The Comboard system permits users of Digital Equipment Corp. computers to communicate with IBM mainframes.

The 3780/VMS Unibus Comboard system includes Sendplus software, which allows DEC Vaxcluster and remote Decnet users to communicate through the Comboard from any VAX in a Vaxcluster or from any remote node using Decnet.

The price for the system ranges from $6,500 to $24,500.

Software Results, 2887 Silver Drive, Columbus, Ohio 43211. 614-267-2203.

Xchange, a software package that was designed to allow unattended file transfer between IBM Personal Computers and compatibles, has been announced by

Continued on page 64

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Continued from page 62

Nochange Software.

According to the vendor, Xchange allows users to perform off-site file maintenance on any remote PC. It can scan home directories, automatically transferring only new or updated files. It compresses data before transmission, the vendor said.

The Xchange system is priced at $149.95.

Nochange Software, 540 Silver Pine Trail, Roswell, Ga. 30076. 404-587-3815.

Protocol converters

Verilink Corp. introduced its **D4/E Enhanced Format Converter (EFC),** which allows T1 users to convert from D1D through D4 framing to Extended Superframe Format (ESF) without changing existing equipment.

The D4 EFC features an RS-232 interface to provide access to the performance data primitives from the D4/E as well as access to the ESF data link.

The D4/E EFC is available in single-line and multiline configurations. Pricing starts at $799.

Verilink, 145 Baytech Drive, San Jose, Calif. 95134. 408-945-1199.

File servers

A family of local-area network communications servers has been announced by **Wellfleet Communications, Inc.**

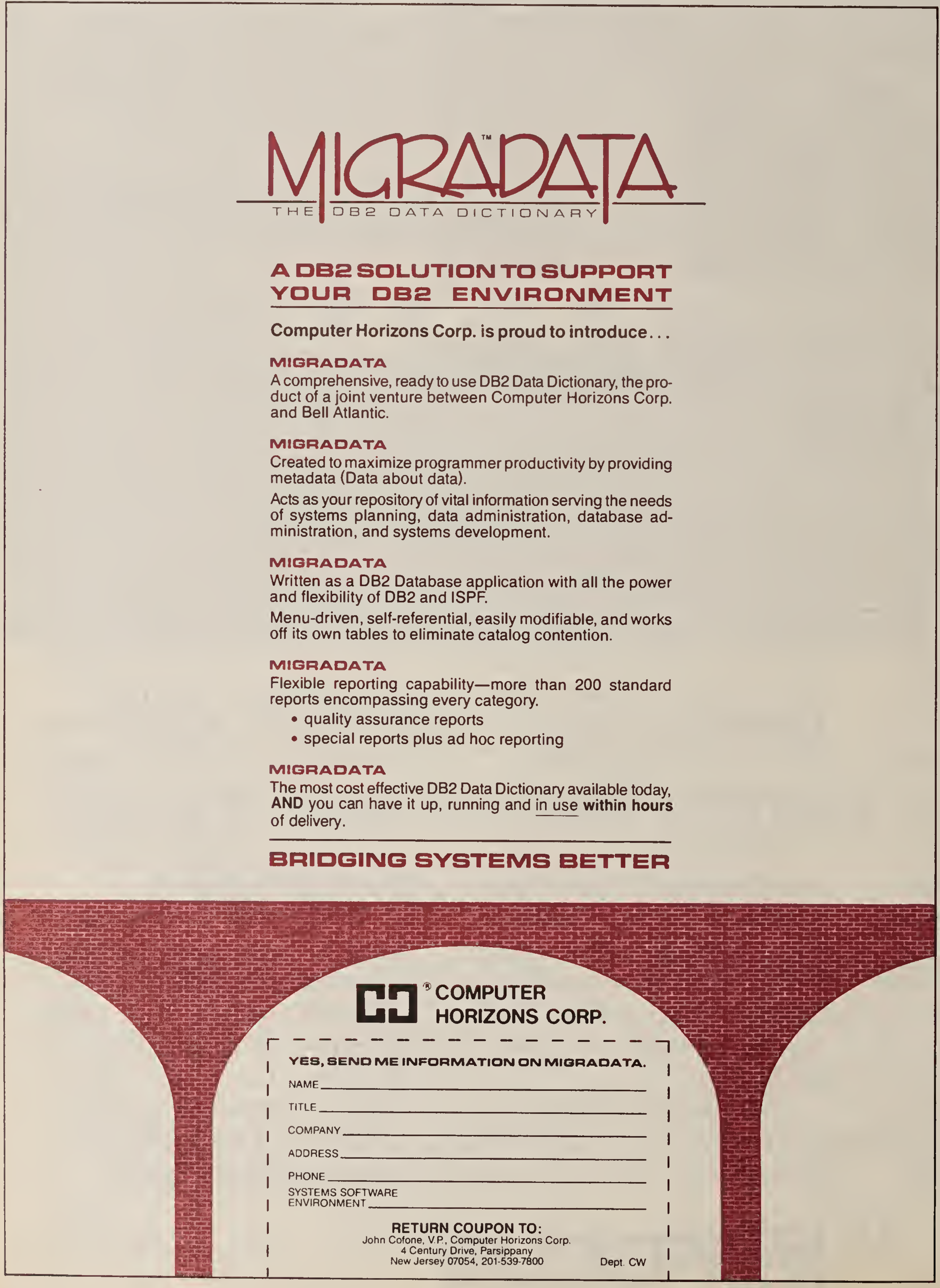
The product line includes the **Link Node** and **Concentrator Node** full-function servers. The Link Node supports direct attachment of up to eight local- or 16 wide-area network links. It can also operate as a remote node, the vendor said.

The Concentrator Node supports direct attachment of up to 26 local- or 52 wide-area network links. It features multiple load-sharing power supplies.

Link interfaces currently available are Ethernet/IEEE 802.3; synchronous full-duplex that is compatible with CCITT V.35 or RS-449 or RS-422; and an AT&T Accunet D4 and ESF frame and format-compatible T1 data service unit interface.

The Link Node starts at $10,800; the Concentrator Node starts at $16,000.

Wellfleet, 12 DeAngelo Drive, Bedford, Mass. 01730. 617-275-2400.



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New Jersey 07054, 201-539-7800
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Electronic mail

The **Mailbox** electronic mail system for the IBM System/38 has been announced by **Britz Publishing, Inc.**

The Mailbox system allows users to send and receive electronic mail through workstations. It can be configured to send messages by user or workstation identification. Features include a full-screen message capability, the ability to send messages to individuals, groups or all users and the ability to check messages at any time.

The Mailbox system costs $99.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201. 601-354-8882.

Security

Dynatech Computer Power, Inc. has introduced the **Surge Sentry** line of protection devices for telecommunications products.

The **PC and Fax Protector** protects one AC outlet and one telephone receptacle from voltage spikes and surges, and the **PC and Modem Protector** protects four AC outlets and one telephone receptacle. Both feature the vendor's patented three-stage protection circuitry, which is said to provide picosecond reaction time and the ability to handle very large power surges.

The PC and Fax Protector costs $74.95. The PC and Modem Protector costs $109.95.

Dynatech, 5800 Butler Lane, Scotts Valley, Calif. 95066. 408-438-5760.

Modems/Multiplexers

A secure fiber-optic multiplexer has been announced by **Gould, Inc.**

The four-channel multiplexer allows transparent transmission at data rates up to 19.2K bit/sec. It operates full-duplex on standard, graded index 50/125 and 62.5/125 micron fibers at a distance of up to 2 km. Other features include a digital encoding scheme on the optical signal, bit error detection and case tamper switches.

Pricing is $6,000 per pair of multiplexers.

Gould, Suite D, 6730 Baymeadow Drive, Glen Burnie, Md. 21061. 301-787-2802.

Telenetics Corp. has announced upgradable personal computer modems in 1,200, 2,400 and 9.6K bit/sec. versions.

The internal card modems can function in full- or half-duplex modes and can be configured to operate over dial-up or leased lines.

Data format can be synchronous or asynchronous. The modems are fully Hayes Microcomputer Products, Inc. compatible, according to the vendor.

The modems cost $595.

Telenetics also announced a family of 9.6K bit/sec. full-duplex modems that were designed for use over two-wire dial-up telephone lines.

The modems use trellis coding and support asynchronous or synchronous operation, Hayes AT command set-compatible commands, local and remote cancellation, autodial and autoanswer, according to the vendor.

Pricing ranges from $1,595 to $2,745.

Telenetics, 895 E. Yorba Linda Blvd., Plancentia, Calif. 92670. 714-524-5770.

COMPUTERWORLD

SPOTLIGHT

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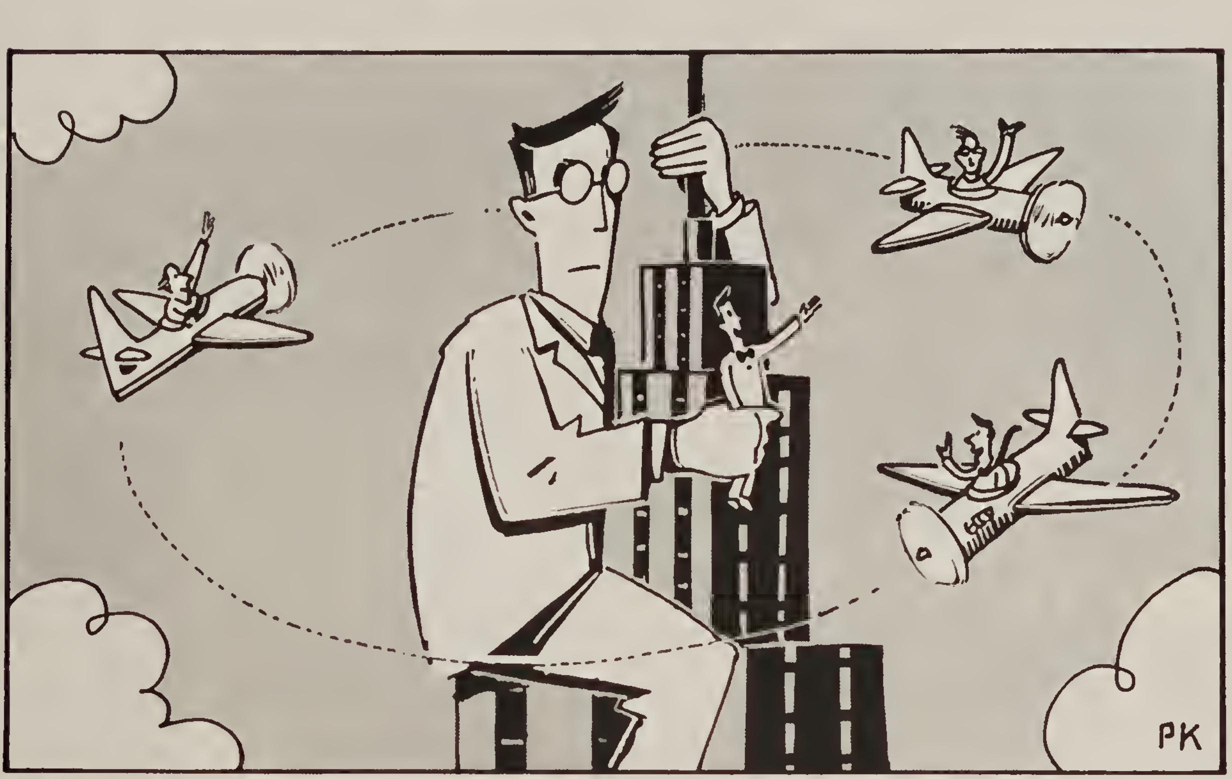
The company's grip may be gentle, but DEC users express frustration with their limited freedom in peripheral selection

USERS WANT FREER HAND

BY REBEKAH WOLMAN



PETER KUPER

The discussion between Digital Equipment Corp. and its customers about peripherals is as old as the company, but the conversation is steadily growing louder and more discordant. DEC started out by putting its energy into CPUs, but as peripherals began to figure more prominently in its plans, the firm tried to protect these adjunct technologies with closed architectures. Customers have always wanted cheaper, higher performing, more reliable peripherals, but now they also cry out for more freedom of choice.

As CPU prices fall, peripherals are becoming an increasingly important source of revenue. DEC is manufacturing more of its own peripherals to save money, and customers say that, after some problematic passages, these machines are becoming more reliable. But the rub lies in the perception that DEC is trying to corral its customers into buying these peripherals.

The company itself has created this perception — by bundling peripherals into packaged systems, continuing to design closed architectures, forcing OEMs to buy licenses to put peripherals on the recent 8000 series VAXBI bus and suing several third-party manufacturers for patent infringement. But the more pressure DEC puts behind its peripherals, the more customers resist buying them.

According to Ray Ball, president of Parse, Inc., an independent developer of DEC diagnostic software based in San Luis Obispo, Calif., "DEC is saying, 'I'm going to make it harder and harder for you to use third-party peripherals.' And the user is saying, 'I don't think you hold me in the regard you should. I'm going to start looking elsewhere.' "

While insisting on choices may mean courting difficulty, many users want the option of sorting through the complexity for the right mix of price, performance and reliability.

"DEC doesn't have the production capabilities to provide the latest and greatest in every peripheral, and they have to make choices about where they put their allocation of internally developed peripherals," says John Logan, The Yankee Group's chief DEC-watcher. "If they put the latest, greatest disk drive line on the Q-bus, there's an opening for a third party on the BI bus. Any manufacturer with a large installed base has that problem, and it takes nine months to a year to catch up."

Right now, the fires of insurrection burn hottest around disk drives and memory, according to Marty Gruhn, vice-president of The Sierra Group in Tempe, Ariz., a market research firm that recently concluded a study on DEC user needs.

"DEC really needs to get its disk drive act together," Gruhn declares. "That's one area in which users are really asking DEC to do something. They want faster and more reliable disk drives."

Logan agrees that this is an area of vulnerability for the vendor. "DEC is behind the times in tapes and disks," he notes, "and they're not providing all the memory users want."

Gruhn and Logan specifically mention the TK 50 tape drives as a weakness but say that's only a starting point. In Logan's assessment, problems

---

Wolman is a free-lance writer based in Cambridge, Mass.

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Freer hand

FROM PAGE S1

exist with the full RE disk drive line, which, he says, "doesn't provide the level of performance required by large data base applications."

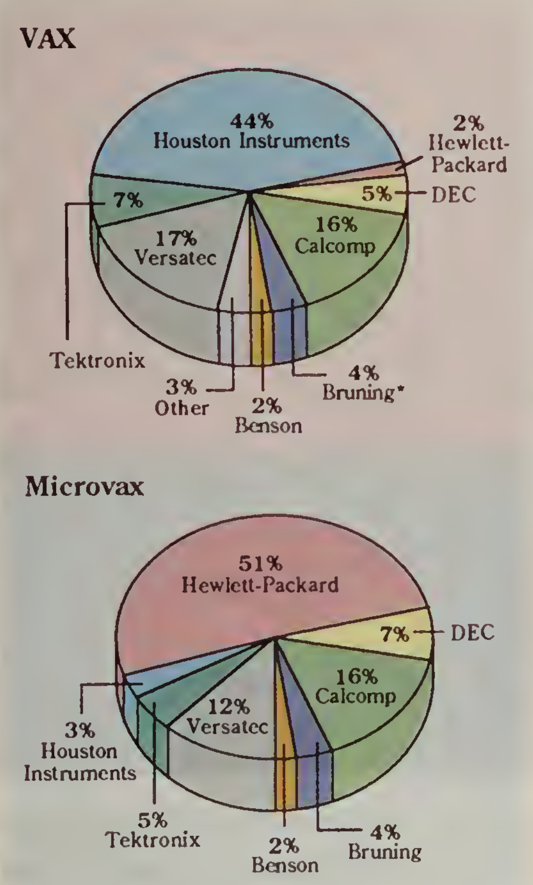
To move or not to move

David Todd, director of university computing at Wesleyan University in Middletown, Conn., says he is sticking with DEC drives on his VAX 8550. But when he adds the next VAX system, he will need more disk space, and he is already wondering whether to remain with DEC or choose an alternate vendor.

Ira Winston, director of the computer center at the University of Pennsylvania's Computer Science Department, says he knows of several people who gave up on DEC drives because of persistent reliability problems with the RE 81s. "There are design problems with those drives," he says. "They are up to revision J1 or J2, which means 10 or 15 major revisions." For some people, he adds, six, seven or eight breakdowns in three years was just too much.

The DEC plotter market

Percent of 1987 market share by vendor



*Formerly Nicolet

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CW CHART

The only reason Winston says he decided to stay with the problematic drives and continue to use DEC-supplied Microvax drives, which are much slower than the third-party competition's, was the poor service reputation of his only local third-party alternative.

There is also dissension on the printer front.

Martin Pring, director of the University of Pennsylvania's Medical School computer facility, contends that DEC has always had problems with electromechanical devices, dating back to the days of card readers. "DEC printer devices leave a certain amount to be desired," he explains. "They're known for unreliability and little annoyances — the paper never stacks properly and so on."

Tom Prescott, supervisor of systems and data processing for Monsanto Co.'s Fibers and Intermediates Division in Pensacola, Fla., stocked his shop with Hewlett-Packard Co. plotters and laser jet printers. He also chose quite a few Printronix, Inc. printers and one or two other special printing devices because DEC did not have what he needed when he made his purchases.

If poor paper-stacking and sticky drives are a nuisance, customers say that some DEC policies, such as restrictive bundling of products, can be downright maddening. It does no good to buy a computer model that suits your needs, they say, if it is bundled with insufficient storage.

"For DEC to try and give me BI machines and saddle me with peripherals that don't allow me to use the power in the machine is technical sacrilege," Parse's Ball says. "I want to be able to get the performance I want, when I want it and on my terms."

Tipping the scales

How far those problems tip the purchasing scales in the direction of third parties depends on many factors — from customers' tolerance for the unknown to the demands of their applications. Pring, for example, says he does not worry about the way his printers stack paper because "our print volume is not that great. The durability, reliability and speed are OK, given our volume. But if we were printing payrolls or insurance lists all day, we might start to get worried."

Pring also acknowledges that his company has always been "comparatively conservative in peripheral selection," and Wesleyan's Todd shares his tendency to stay just a little bit behind. "It gives us an opportunity to evaluate other people's experiences with new systems," Todd says.

Conservatism can work the other way, too, however, as Larry Tashbook points out. Tashbook, director of strategic marketing for Emulex Corp., says many of the company's customers are "less inclined toward risk-taking than you would imagine." In large part, he says, they are VAX Unibus customers who are being "abandoned by DEC" in the BI and Microvax excitement. "Our products address the installed base, the customers who may be too conservative to move."

While Tashbook questions the common customer perception that mixing vendors threatens a system's reliability, he describes other Emulex buyers as sophisticated and price-conscious, "willing to take some of the risk of buying outside of DEC."

Ball sees a more independent attitude developing, even among the typically more dependent kind of clients, and attributes it to a mixture of economic and geographic necessity.

"In the Texas oil patch and the Rocky Mountain states," Ball says, "users have had to become sophisticated. Their installations are somewhat remote, and they've taught themselves to not be afraid of implementing a pioneer spirit." The recent economic downturn, he adds, has probably made them, if anything, more tolerant of a risk that offers a savings.

Unix choosers

Another active customer segment for third-party peripherals consists of VAX users operating under Unix rather than VMS.

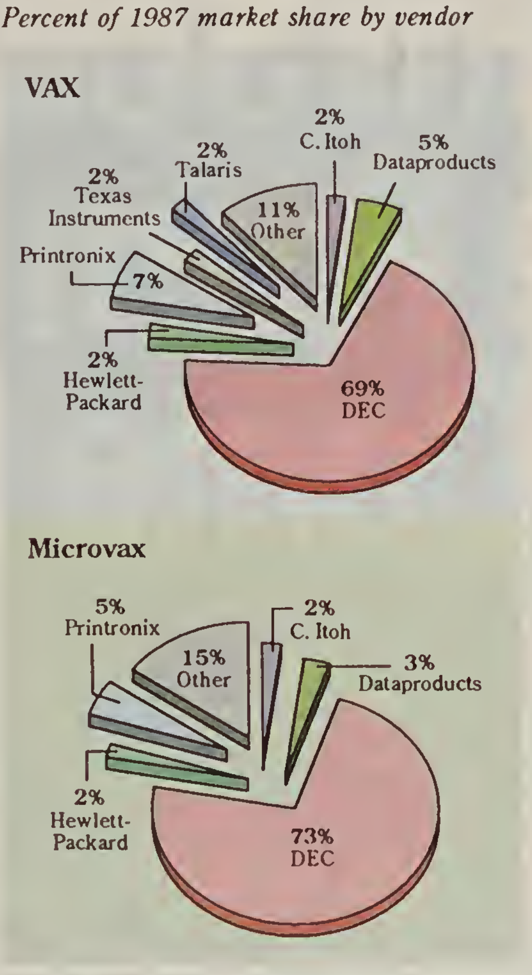
"Those users are not slaves to the requisites of VMS," Ball says, referring to DEC's selective bundling of the VMS operating system with particular hardware configurations and its strict licensing of maintenance diagnostics. "Since they're not as dependent on DEC for service and support, they're further away from any of the ways DEC can punish them for using foreign peripherals." Besides, the University of Pennsylvania's Winston adds, Unix, by its very nature, is more inclined to support foreign peripherals more dependably.

Monsanto's Prescott says, "Our decisions are based on two factors — the viability of field maintenance and whether a product brings something unique to the party."

The size of the company is another variable, and, like conservatism, is one that can work both ways. Winston suggests that larger shops are less likely to buy from third-party vendors. "When you have one Microvax, you tend to buy little things from everybody, but the big computer centers don't have time to fool around with that. They want one-vendor service," he says.

The DEC printer market

Percent of 1987 market share by vendor



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But some shops do not even begin to shop around until the numbers justify the effort. John O'Donnell, who runs the data center at Boston's Shawmut Bank, says the center will soon "have enough DEC equipment on the floor to make it worth looking at other vendors. But so far, for the numbers, it hasn't been worth dedicating resources to studying the market."

Mind your 'Ps'

Probably the strongest influences on purchasing decisions are the "two Ps" — price and performance, or more accurately, performance/price, according to Bill Patch, vice-president of marketing and planning for Sorbus, Inc., an independent maintenance company operating in the DEC market.

Even though it is standard procedure to put price first in the ratio, the reverse, he says, "more accurately reflects the customers' requirements. They don't want to sacrifice quality to save a couple of bucks. It's only when they look at products from two organizations and find performance equal that they look at price."

Whichever comes first, Winston confirms that "historically, the reason for using non-DEC peripherals has been price." In Winston's case, this means using National Semiconductor Corp. and EMC Corp. memory for savings that are as substantial on maintenance as they are on purchase price.

"Right now, I don't even think about DEC memory," Winston says, explaining that DEC maintenance costs are "out of control."

Winston's posture may, he concedes, change with the next round of purchasing. "DEC," he says, "is getting more competitive with memory pricing."

Furthermore, Winston can now also take advantage of the Campus-Wide Agreement that DEC has offered to a couple of dozen large research universities like Penn. These blanket discounts have made third-party purchasing much less attractive to the universities that have been offered them.

Pring, another beneficiary, says, "The discount agreement has tipped the balance. Rather than having a mixed bag and getting a somewhat cheaper rate on some non-DEC peripherals, the discount makes it more advantageous to go all the way with DEC."

But, as Patch implies with his performance/price philosophy, price is not everything, and deals like Penn's can cause frustration. Tom Kuhn, director of computing and instructional technologies at the University of Pennsylvania's Wharton School, laments the fact that the Campus-Wide Agreement is squelching his third-party purchasing.

"With this deal, a third party can't touch DEC on price," Kuhn says. "This is really making it difficult for us to go with third-party equipment."

Price by itself is a fairly objective matter; price in relation to performance is something more subjective. Performance needs are individual and application-dependent. What suits one user is hardly sufficient for another, and each user has a different sense of value.

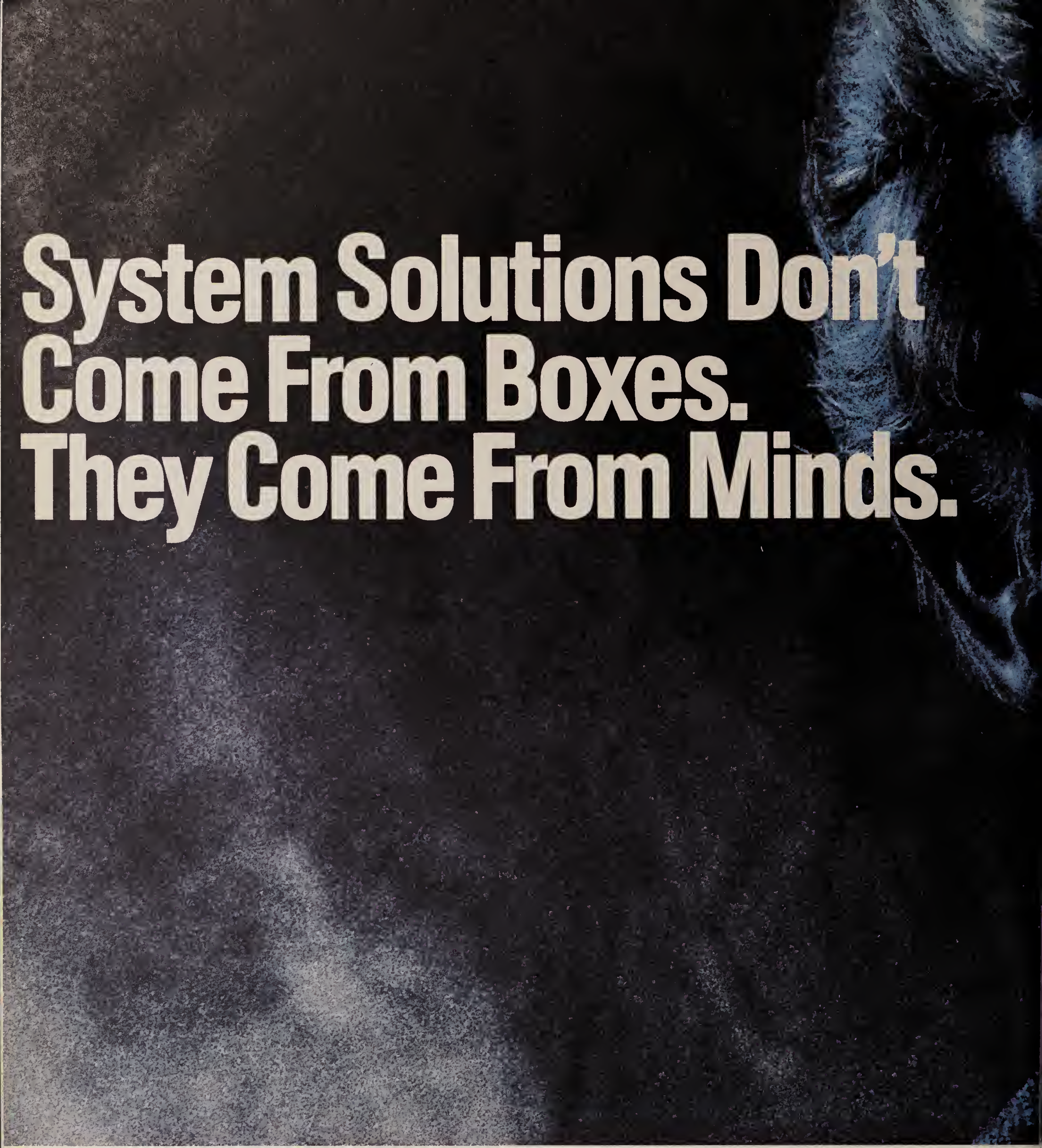
Pring says he is "reasonably satisfied with current disk technology," but his facility has only about 1.5G bytes on-line. "We're not in a situation that requires volumes of storage that DEC technology doesn't address."

On the other hand, others' graphics, multiuser or data base-oriented systems require high performance that they can only get from third-party peripherals.

Nature of the beast

The nature of the application is another major influence on purchasing, one becoming more important as DEC equipment is used for more critical applications. Sorbus's Patch sees "DEC equipment migrating from being pretty much niched in scientific and engineering uses to being used more in the mainstream to run business processes. It used to be that if a DEC system in R&D went down, the IBM systems in the rest of the company went on generating invoices."

Increasingly, DEC equipment is generating those invoices. But whether a user wants to mix up the peripherals on an invoice-generating system is the most subjective question of all, and users' responses reflect their tendencies to associate both DEC



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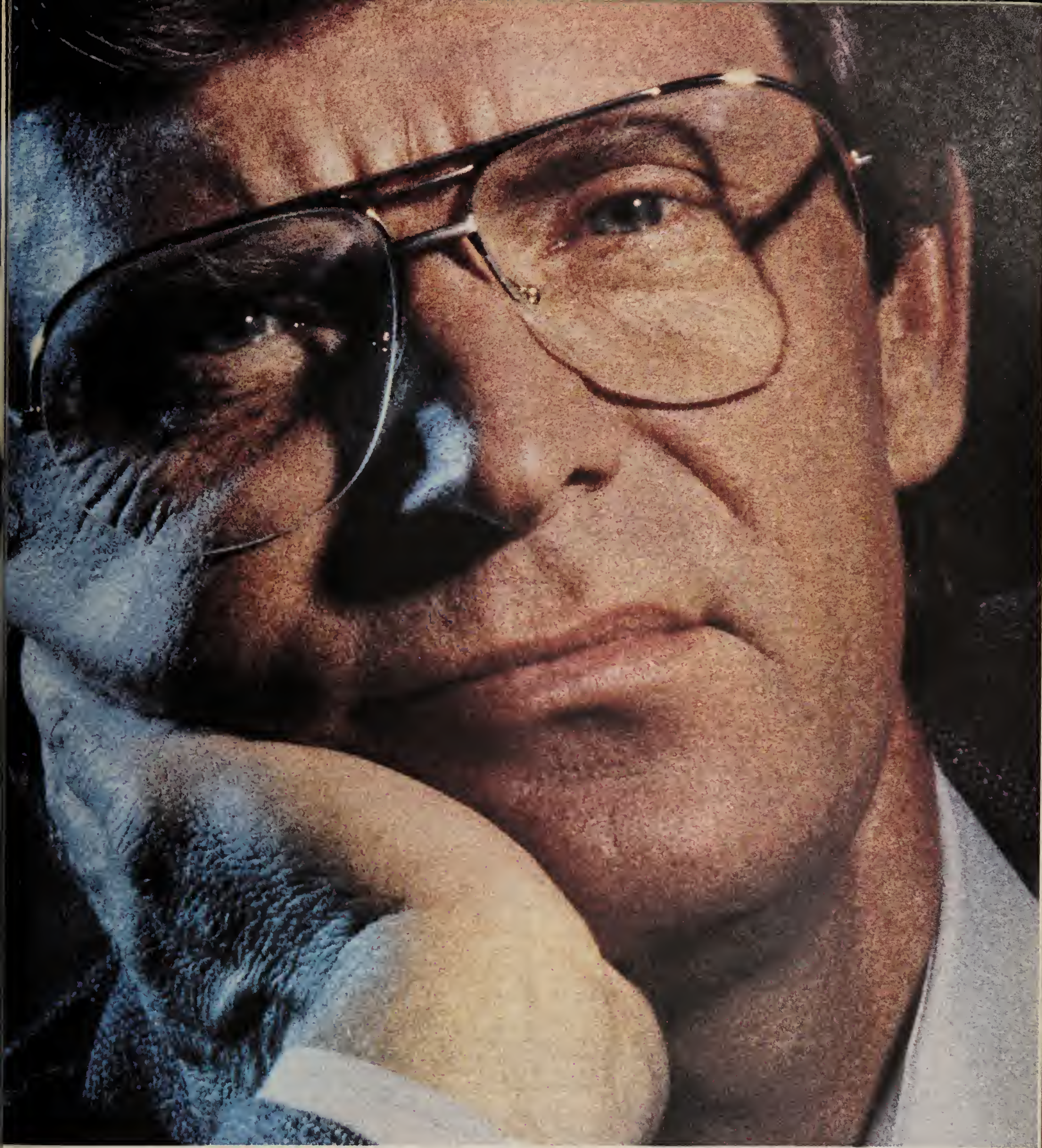

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and homogeneity with reliability.

Shawmut Bank uses DEC equipment for wire transfers, asset-based lending and other money-related applications. "It's not worth it to us to try and save money on a disk drive if it's going to be down three times a year," O'Donnell says.

Todd's one-brand philosophy is tied to the use of his system at Wesleyan. "In other areas," he says, "we're not so conservative. But with the central system, we have no choice because we're on such a tight schedule and have so many things to worry about." The implication is that a potpourri of equipment would be just one more thing to worry about, and that's the way many users feel.

Cluster complication

Users of DEC's newer, clustered environments are particularly reluctant to venture into the third-party market. Until now, says John Bedingfield, director of information services at Baptist Memorial Hospital in Memphis, "all our tape drives, all our disk drives and all our multiplexers have been third party — some memory, too. And so are all the tape drives in our cluster. But they can't take advantage of everything the cluster can do.

"We're not going to use as many third-party vendors because of the shared environment," Bedingfield says. "We've tried a few disks and tapes, but they haven't worked as well as DEC's. Little glitches in the interfaces can cause problems if you don't identify them until too late, and it's just safer in the cluster environment to stay with DEC.

On the PDP-11, the applications were machine-specific, and any problems only affected that application. Now it's possible to affect everybody."

> "TRADITIONALLY, DEC users have been experimenters. They haven't been willing to kowtow. But as the company moves further into the IBM environment, more new users are sticking close to Mother DEC."
>
> JOHN LOGAN
> THE YANKEE GROUP

The acquisition of clusters not only makes decision makers more conservative, but it also makes their decisions more complicated. Mel Kestenbaum, director of information systems at the *Bergen Evening Record* in Hackensack, N.J., notes, "It's more than just dollars. You have to consider your scheme, your architecture, your future plans. You have to think more long range than in the past."

Wesleyan's Todd's basic conservatism is reinforced by his recent VAX 8550 acquisition. "We bought all DEC products to go with it, including laser printers, disk systems, an impact line printer and terminals."

In part, Todd says, the uniformity resulted from the desire to negotiate a package deal. But first-time jitters also played a role. "This was our first large VAX," he continues, "and we wanted to make sure we had a system we could manage without the problems of a third-party vendor. Some equipment isn't 100% compatible, and having to debug that on top of everything else we're going to have to do right now doesn't make sense. We need to build our expertise with the system."

Also, Todd adds, DEC made the price of the VT220 terminal so attractive that there was little incentive to look elsewhere. "The disk area was one place where cost might have been saved, but we didn't want to take the risk. We wanted to start with a system we knew would be reliable," he says.

In DEC they trust

In some users' cases, DEC's reputation for reliability is so entrenched that it outweighs certain disadvantages. At CH2M Hill, Inc., a Corvallis, Ore., engineering and consulting firm, production manager Stan Carpenter says no more than 10% of the peripherals in the DEC shop come from third-party vendors. "DEC doesn't always offer the best performance at the best price," he says, but "its products are dependable and reliable."

And when they aren't reliable, many users say, you can at least depend on the maintenance crews. DEC's field service has been a major factor in Texas Gas Transmission Corp.'s decision "to more or less be a DEC shop."

And the University of Pennsylvania's Winston concedes that, "Through our whole disk drive episode with DEC, they kept coming to fix it. Regardless of how bad the product is, DEC has a commitment to keeping it working. And you can always pin them down."

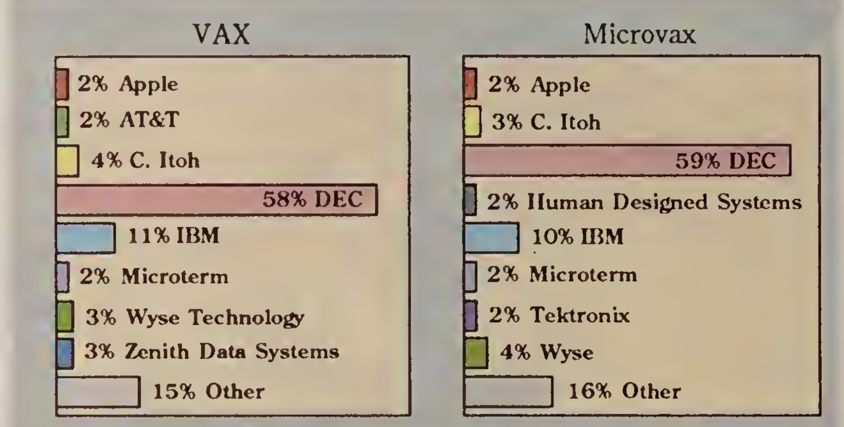
For some, that satisfaction has become a kind of allegiance, which The Yankee Group's Logan says is more likely to be found among new users.

"It's not a DEC religion," he says. "In fact, it's the opposite. Traditionally, DEC users have been experimenters. They haven't been willing to kowtow to DEC's requests. But as DEC moves further into the traditional IBM environment, more new users are sticking close to Mother DEC while learning products. And within a full system, the cost or performance of one disk drive is not going to make or break anybody. It becomes relatively minor when you look at the whole picture."

Tom Gibbons, director of information systems and resource planning at SLI Avionic Systems Corp. in Grand Rapids, Mich., says he runs a "100%-pure DEC" shop in order to maintain the integrity of his relationship with DEC and to take advantage of discounts and service.

The DEC terminal market*

Percent of 1987 market share by vendor



*Includes personal computers that are being used as terminals

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CW CHART

It is difficult to tell exactly how much care customers need to put into preserving their relationships with DEC — if they're not worried about quantity discounts, that is. DEC claims it will service third-party peripherals, but the quality of that service and the integrity of the claim are open for discussion.

Mike Lewis, vice-president of finance at Emulex, says his company has arrangements with various firms to maintain its products. DEC is one of those firms. "Historically, they've shown no reluctance to maintain our equipment. DEC has, at times, changed its posture with respect to Emulex, but not to Emulex's customers. As far as they're concerned, Emulex's customer is DEC's customer."

Better to service than fight

Logan's comment on DEC's maintenance of third-party equipment begins on a similar note: "They'll support whatever's been put on a system. They've found it's better to join than fight. Fighting created a lack of comfort and an opening for third-party maintenance companies to go into the DEC base. Servicing requires minimal extra investment on DEC's part, and they have more to gain by being willing to service other products — or at least representing that they do."

Here, Logan changes his tone. "DEC has enough problems servicing its own products. I can't help surmising that third-party products must offer a lower quality of service."

"You have to shine a good light on which ones DEC really supports and which ones it won't," Parse's Ball says. And pleased as Winston was with DEC's persistent maintenance of his troublesome RE 81 disk drive, he says "it's not clear whether they would have been as good if it had been a third-party disk."

While some users respond to that service discrepancy by buying more DEC equipment, others respond by seeking third-party maintenance (see story page S12). And no matter how hard DEC tries to keep its customers away from third-party vendors, it probably will not be able to try hard enough. Some believe it would be a mistake to try any harder.

Although DEC has sued Emulex for patent infringement (a case that was opened in 1985 and has still not been resolved), Emulex's Lewis says, "I wouldn't say the litigation per se drives us toward or away from any particular markets. Emulex feels strongly that it is not infringing on DEC's rights, and we think the DEC marketplace is a vibrant, healthy one."

Bob Gannon, corporate counsel for System Industries, Inc., says he is also optimistic about System Industries' continuing activity in the DEC world. As part of the out-of-court settlement of DEC's 7-year-old patent suit against that company, "we've set up formal communication mechanisms that will help prevent further trouble," he says.

The fine line

The Sierra Group's Gruhn says DEC is "walking a fine line. They've closed the BI bus for all intents and purposes, but to take IBM, DEC needs all the third-party help it can get. The more DEC equipment and third-party equipment out there, the better for DEC. The tendency to cut off OEMs is foolish."

After all, it was those very OEMs and value-added resellers that put DEC where it is today, as Andy Michuda points out. Michuda, who manages DEC marketing for Control Data Corp.'s Technical Services, estimates that about five years ago, 45% of DEC's hardware was sold through other channels.

Emulex's Tashbook says that in enhancing its own product line, "DEC has created more opportunity for us. Providing that kind of processing power in a small system requires far more sophisticated storage capabilities than are normally available, and we'll be there with higher capacity and functionality."

No change ahead

Whatever the effects of DEC's strategy, and whatever experts recommend, DEC observers do not see the company changing its course. Logan says it has always been DEC's strategy "to keep new technology closed and then open it up at the end of its life cycle. I don't think we're going to see a change in that strategy."

Ball agrees, but he does not think it can stay this way forever. "DEC has to hurt before it'll do anything. Right now, they're lulled by the great success they've been having in capturing the IBM market. They can forgive themselves the erosion of their own marketplace.

"The numbers mean 'I'm growing,' " he continues, "but they're losing the customer loyalty that got them where they are in the first place. As soon as IBM turns around and says, 'I don't want DEC to do that,' and the $50-billion-a-year elephant steps on the $10-million-a-year mouse, DEC will realize its folly — but only when it hurts."

Logan says pain is a long way off for DEC. "People are threatening to go out and purchase third party, but there's no mass defection happening."

Logan says the customers who are most upset are the "under half-a-million dollar OEMs, especially those near the [$500K] borderline." Buying less than $500,000 a year, these customers are excluded from DEC's umbrella discounts.

However, Logan explains why their vociferation does not mean much to DEC by pointing out that "80% of the customers buy only 20% of the equipment. They're more numerous than they are powerful."

A recent survey by The Yankee Group shows no mass defection. "We asked users if they were planning to buy mass-storage peripherals to add to their DEC systems," Logan says. "For all the talk you hear about mass storage from third parties, they were only planning 1.5% of their budgets for third-party DEC peripherals."

And the more things change, the more they stay the same. Logan says The Yankee Group came up with exactly the same number when it first tracked this information in 1980. •

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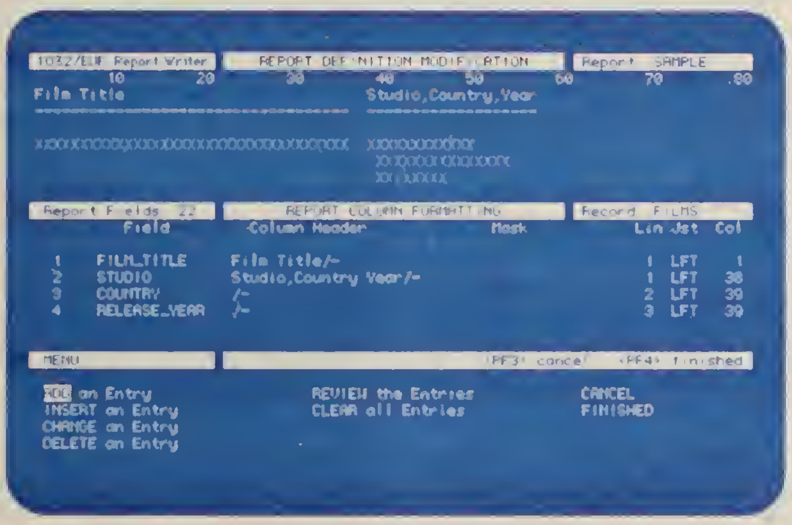

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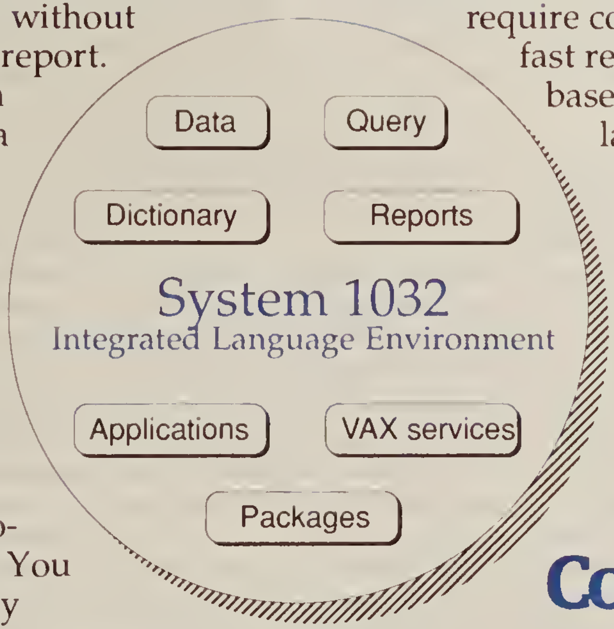

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Third parties anticipate arrival of DEC optical standard

BY LAURA DIDIO

The optical disk storage market is suffused with the kind of anticipation that typically surrounds the birth of a baby. Everyone is planning for the adulthood of a technology that is only now reaching infancy.

Optical disks offer some distinct advantages over their magnetic or hard-disk counterparts. They offer enormous storage capacity, lower unit-storage costs and greater durability. According to Victoria Kader, international economist for the International Trade Administration (ITA) of the U.S. Department of Commerce, the cost per megabyte of magnetic disks ranges from $20 to $30, compared with $2 to $5 for a write-once read-many (WORM) optical device.

There have been several false starts on delivery of the technology, but now, vendors and industry analysts alike predict that optical disks are on the verge of becoming viable storage solutions in their own right.

Market research firm Dataquest, Inc. in San Jose, Calif., predicts that optical storage products may garner as much as 10% of worldwide sales in the overall disk storage market by 1991. These projections are supported by the fact that at least 20 companies worldwide either have products or are developing products for the optical market.

Currently, there are three main types of optical disks:

- Compact disk/read-only memory (CD-ROM) disks, which can be read but not written over.
- WORM devices, which use magnetic platters on which users can write large amounts of data but not make any changes.
- Erasable disks, which combine the large capacity of optical with the reusability of magnetic.

Jumpy for WORMs

Digital Equipment Corp. users and third-party vendors are particularly eager for the Maynard, Mass., corporation to unveil its first WORM product. DEC's entry into the market, they say, will legitimize optical storage as a technology and set an industry standard.

According to Bryan Fifield, a director at Distributed Logic Corp. (Dilog), most third-party suppliers, including Dilog, have waited for DEC to announce its WORM product because they have not wanted to tamper with DEC's proprietary VMS operating system.

"Third parties don't want to write their own software driver interface," Fifield says. "That would cause chaos in the market. You'd end up with a proliferation of interface drivers, none of which would be compatible on any level."

The archival capabilities of optical represent the technology's greatest lure right now, Fifield explains. The storage potential of optical is virtually unlimited. Personal computer users, for instance, will be able to permanently store hundreds of megabytes, or hundreds of thousands of typed pages. The shelf life for an optical system is 10 to 20 years, as opposed to a tape system that has to be redone every two to three years, Fifield says.

Storage backup and archiving are the immediate uses that have one large shop excited about the prospect of a DEC WORM product. Other possibilities for the technology may exist, notes a system manager at the DEC shop — a major East Coast financial concern operating under a nondisclosure agreement with DEC — but they are difficult to estimate without seeing the product.

> "THIRD parties don't want to write their own software driver interfaces."
>
> BRYAN FIFIELD
> DISTRIBUTED LOGIC CORP.

Although the appearance of a WORM disk would be good news, the manager says, what the financial firm is really looking forward to is the announcement of an erasable disk.

Proceed with caution

Although perhaps slower than most, DEC is not the only vendor to adopt a cautious approach to optical disk technology.

Jim Porter, president of market research firm Disk/Trend, Inc. in Mountain View, Calif., notes, "The NECs and the Sonys have been spending a lot of development money, as has IBM, but they've all been slow to market."

Based on the pace of announcements at last month's Comdex/Fall '87 show, however, Porter says the market seems to have shifted into a higher gear. "Sony and Sharp both demonstrated 5¼-in., 325M-byte erasable opticals and claim that they'll have production quantities shipping in 1988," he says.

In addition, Eastman Kodak Co. and Verbatim Corp., as part of a joint development deal, demonstrated their 3½-in. optical drive (the only one to date) at Comdex. Although the final specifications for the device have not been released, industry sources say it will probably be about 70M bytes. No shipping date has been announced.

Still, Porter says he has no doubts as to which company will eventually become the biggest player in the market. "IBM will be the biggest in the industry," he maintains. "They'll use opticals to replace tape drives in their mass storage systems. That is a product that the industry has been waiting for for 25 years."

Full speed ahead

In the meantime, the wait for a DEC WORM product does not seem to have dampened enthusiasm for optical storage in the DEC third-party world.

Maxtor Corp., Hitachi Ltd., Laser Magnetic Storage International (a joint development between N. V. Phillips and Control Data Corp.), Toshiba Corp., Sharp Electronics Corp., Matsushita Electric Industrial Co., Optimem Co. and even such small companies as EMC Corp. are all proceeding full speed ahead with optical offerings.

Hopkinton, Mass.-based EMC says that neither it nor its customers wanted to wait for a DEC optical device. So last summer, EMC introduced its VAX-compatible Archeion optical disk subsystem featuring tape emulation.

Laser Magnetic Storage in Colorado Springs is addressing all portions of the optical market, from CD-ROMs to a forthcoming erasable offering slated for delivery in late 1988, according to Phil Shires, the firm's vice-president of marketing and sales.

No company is more excited about the prospects in optical than Maxtor, says Gordon Knight, the company's director of optical technology. Maxtor is currently shipping a couple of thousand units a month of its RXT-8008, a 5¼-in. WORM drive featuring 800M bytes of storage with a small computer systems interface.

Maxtor also has designs on the market for erasable optical devices. According to Knight, the company is currently working on a 5¼-in. magneto-optic erasable drive that it expects to announce sometime in 1988.

New markets

Neither Devin, Dataquest's senior industry analyst for computer storage products, nor the ITA's Kader say they believe optical devices will displace hard or magnetic disk drives, although these devices may make inroads into the tape portion of the market. Rather, the analysts say, optical disks will create their own markets and applications.

"It appears to us that optical will generate new applications rather than supplant magnetic disks and the applications they serve," Devin says. "The real acceptance of optical ultimately depends on vendors' creativity to define these new markets that users are willing to pay money for."

Knight says he agrees with that assessment and also with another projection that Devin and Kader both advance — that it will be 1990 or so before the impact and widespread usage of opticals is really evident in the market.

"Each new memory solution is part of a continuum," Knight says. "Optical is one of the solutions. It will replace some portion of the tape market and enjoy some penetration of the Winchester hard-disk market and even some semiconductor memory, depending on the solution. But generally, optical disk devices will solve application-specific problems." •

A pledge of intent

In an effort to strengthen its commitment to optical-disk technology, Digital Equipment Corp. today revealed plans for a write-once optical-disk product at a meeting of the Digital Equipment Computer User Society in Anaheim, Calif.

F. Grant Saviers, DEC's vice-president of storage systems, pointed out in a recent interview that today's announcement is one only of intent (see story page S9). A formal product announcement will be made after January 1, he said.

Though he would not reveal shipment dates, prices or model numbers, Saviers did say that the product will be a 12-in. disk with 1G byte of storage per side and a life expectancy of up to 30 years.

The disk will reportedly be VAX compatible via the VAXBI bus, Unibus and Q-bus and will have full Digital Storage Architecture support. DEC also plans to provide a library capability in the form of a jukebox-like device and a fully compatible software management system.

According to Saviers, an obstacle to the successful implementation of write-once technology has been that software, thus far, has not been written to optimize the technology's capabilities. DEC, he says, has decided to focus its efforts in that direction.

"Software is not organized to handle write-once technology," Saviers explained. "You expect to be able to update directories and move things around on the disk, and right now you can't. We've decided that that is the contribution we want to make."

In today's announcement, DEC pointed out that it views write-once technology as critical for two main storage applications: archival or permanent storage and library management.

"The general direction that you want to take with write-once technology is toward archival applications," Saviers said. "People who collect large amounts of data, as in scientific, laboratory or government applications, want to collect data once and make it permanent. Write-once technology is ideal because the cost per bit stored is inexpensive even though the disk itself is expensive."

DEC says it expects a large audience in the business and industry marketplace for this technology. Keeping track of large amounts of data is already a difficult task. "Data disappears into the giant maw of the data vault, never to be seen again. It becomes write-once, read-never," Saviers said.

The attributes of optical disk — large capacity per disk, low cost per bit stored, durability and permanence — have piqued DEC's interest in the technology. Saviers said he cannot understand the criticism that DEC has been behind in the optical arena.

DEC, he points out, was the first vendor to bring out compact disk/read-only memory technology; write-once represents the next generation in optical storage. DEC is committed to the third stage — magneto-optics, a technology Saviers said he expects to mature in the next two or three years.

GLENN RIFKIN

DiDio is a free-lance writer based in Boston.

INTERVIEW
'NO DESIRE TO WALK AWAY'

F. Grant Saviers, vice-president of storage systems, is a 20-year veteran of Digital Equipment Corp. Since joining DEC in 1968, Saviers has been intricately involved in the company's disk and storage products. Appointed vice-president in 1981, he is currently responsible for worldwide engineering and U.S. manufacturing of all disk, tape, memory and optical products. *Computerworld* Senior Editor Glenn Rifkin recently met Saviers in his office in "the Mill" at DEC headquarters in Maynard, Mass., to discuss DEC's view of third parties in the peripherals market.

How do you respond to a customer who says DEC is deliberately making it harder to use third-party peripherals and that, by taking that direction, it is making users feel they're not held in high regard and should look elsewhere for a vendor?
We have no desire to make customers look elsewhere.

Certainly we want to sell customers a system that meets their needs. We can provide the integrated hardware and software system and the network that delivers the functionality.

There are some things we don't make, but we either provide the license capability or attach those products to our systems. The Unibus and the Q-bus have been open buses. So there are ways to get there.

Our desire is to provide the entire system and all the capabilities and to do that competitively.

There was a time, wasn't there, when third parties were embraced more than they are now?
That's an interesting perception. There was obviously a large third-party market. Digital is a big company, so there is always some kind of specific solution or custom requirement by a customer. But in terms of having a general policy in which we embraced third parties, I'm not sure we ever had that.

You've been at the company for 20 years. Have you seen some changes in attitude toward third parties in that time?
Less so than perhaps some people believe. We've always said that from an intellectual property viewpoint, we have certain rights, and we've pursued those rights over the years.

If there's been a dramatic shift in the company's business in the last five years, it has been in doing the entire job as opposed to providing unique pieces of iron.

What impact has that change had on the third-party area?
When you get into specific policies that deal with third parties, I don't see much change.

According to Marty Gruhn of The Sierra Group, "DEC really needs to get its disk drive act together. Customers want faster, more reliable disk drives." What is your response to that?
There's a game of "specsmanship" that gets played by focusing on some device characteristics such as average seek time. That's not really what matters to the customers.

What matters to the customer is how much time goes by from when he issues a request of the operating system to when the data comes back to the VMS driver. When you look at our products on the real throughput the customer gets at a subsystem level, we're very competitive. We're very competitive, not only with many of the third parties but also with the largest IBM-class machines.

What about reliability?
We've come a very long way in terms of reliability.

We did have a problem three or four years ago. But we see in our customer surveys that we are doing exceptionally well now with reliability.

Why would The Sierra Group still be saying these things then?
I think it's old tapes. Or perhaps [those customers] are not using DEC service, so they're not tracking some of the product improvements that have been made. But in major accounts, we've made dramatic progress.

What about the problem with the RE 81 drives? Has that been handled?
Yes. We completely retrofitted the installed base on that. We wrapped that up last winter and made substantial improvements. That was a major undertaking for the company.

What was wrong, and what did you have to do?
We had a supplier/manufacturer gasket adhesive that deteriorated about two years into the life of the product and caused contamination. It was one of those things that sneak in on you despite extensive testing.

The first production lots were fine, but then, because of this material, the problem showed up two years down the road. It was one of the "gotchas" that unfortunately happens in these kinds of precision, electromagnetic products. Everybody else in the industry has had a problem like this. IBM had a problem and Control Data Corp. is going through their problem right now.

Did you get to everybody in time to solve the problem?
Because we had such a huge installed base, it took us about a year to do the retrofit. Some people were unhappy during that year.

What's your damage report?
I think it's very good. The bottom line is that we stood behind the product, and the new products are dramatically better. Our most recent market research data shows us that the reliability issue is behind us.

Have there been memory problems?
Not that I know of. There was a fair amount of criticism a year ago about memory pricing, but that has improved dramatically. With the advent of some new technology — the larger dynamic random-access memory devices — we're basically leading now in terms of surface-mount packaging technology. We've got some of the highest density, lowest cost memories in the industry.

Many folks don't understand that in positioning VAX systems against products like the IBM 9370, we've got very much larger address space. And the physical capacity of each of our systems is very much larger.

Are VAX Unibus customers being abandoned by DEC in favor of the BI and Microvax excitement?
I wouldn't say "abandoned." We don't abandon anybody.

F. Grant Saviers
ALAN WITSCHONKE

Would there be a perception on the customer's part that the train is going in a different direction and that they must get on?
The customer has a choice of moving to a new generation of technology or staying with what they've got. They have to make that decision based on how important it is to move vs. how costly it is to change. The good thing about the Digital Storage Architecture is that it works on all the buses, so the investment is protected.

But there are some former OEMs who feel exiled by DEC, for example with things like the BI bus. Could you address that?
That's kind of history at this point. That's two years old.

There's still some anger out there. Is it a closed issue internally?
When a customer is angry,

Continued on page S16

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Dr. Kenneth Thurber, President, Architecture Technology

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James G. Herman, Independent Consultant, and **Mary Johnston,** Senior Consultant, Telecommunications Consulting Group at BBN

ISDN is fast approaching. Some say with too little agreement on fundamental standards and applications. Attend this highly focused, intensive session to anticipate the emerging standards, vendor trials, conflicts, successes, products and service offerings that will emerge over the next several years. **Level:** Intermediate.

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As OSI and the older standards are reaching maturity, numerous new standards are in the works. Attend this intensive session for a look at the new generation of standards — including their purpose, significance, applications, and technical elements. **Level:** Introductory.

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Haines Gaffner, President, LINK Resources Corp.

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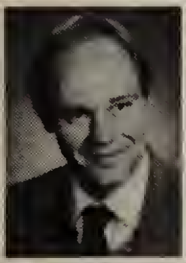
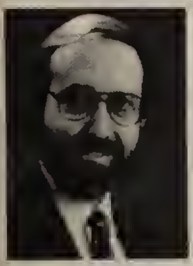


This one-day course will help you successfully operate a network control center on a day-to-day level. You will focus on the practical requirements, functions to be performed, systems and tools available and how to put them all together to gain control over your network. **Level:** Introductory.

T-12 REGULATORY ISSUES AND ANSWERS
Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding

Take this comprehensive seminar to make sense of the increasingly complex regulatory environment. You will receive a thorough briefing on the legal, social, and regulatory issues, the evolution of vendor technology and industry standards, and significant developments affecting the coming regulatory year. **Level:** Intermediate.

T-13 INTRODUCTION TO DATA COMMUNICATIONS
Gary Audin, President, Delphi Inc.



This perennially popular tutorial provides exactly the right mix of concept, technology, and application for the beginner to get a good foundation in data communications. The course notes are excellent reference material and the instructor is one of the most highly regarded professionals in the industry. **Level:** Introductory.

T-14 INTRODUCTION TO VOICE COMMUNICATIONS AND PBX
James Morgan, Principal, J.H. Morgan Consultants

Enroll in this full-day tutorial for a comprehensive foundation in the basics of voice communications — technology, PBX characteristics, switched networks, tariffs and services, as well as an overview of traffic engineering. **Level:** Introductory.

T-15 IMPACT OF THE NEW POST-DIVESTITURE TARIFFS ON LARGE NETWORKS
Robert L. Ellis, President, The Aries Group

In this intensive tutorial you will learn the structure of the post-divestiture tariffs, the latest January 1988 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics in configuring data networks, the LATA-pure strategy and federal access tariffs and how to use them. **Level:** Intermediate.

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Their toes get stepped on, but third parties keep waltzing

Tough but still profitable is the way third-party manufacturers of Digital Equipment Corp.-compatible machines characterize business in the DEC market today.

Tough because with each successive, spectacular financial quarter, DEC makes it more difficult for third-party rivals to share in its success. The Maynard, Mass.-based corporation is pricing very aggressively, especially in the terminal and memory board segments. These markets have experienced price declines of up to 50% and 75%, respectively, in the last 18 months, in large part because of DEC's aggressive price markdowns.

In addition to instigating price skirmishes on these fronts, DEC has begun bundling more of its systems, tightening its software licensing policies, closing its bus architectures — most notably the VAXBI bus — and backing up its often-stated warning of "vigorously enforcing patents and trade secrets" with swift legal action.

Court or courtship?

Since 1980, DEC, which owes no small measure of its current prosperity to its third-party following, has initiated at least eight major lawsuits — several still ongoing — against more than a half-dozen of its competitors.

These actions by DEC have left third-party producers at once angry, ambivalent, wary and, in some cases, bloodied. But despite their consternation at DEC's strategies, third parties and their customers remain unabashedly bullish on DEC hardware. And there is good reason to continue the courtship: The DEC market is one of the most lucrative in the entire computer industry.

"It's like making love to a porcupine; you have to do it very carefully," says Amos Deacon, president of Orange, Calif.-based MDB Systems, Inc. Though the relationship may be stormy, as a DEC OEM system enhancer, MDB derives 60% to 70% of its sales from DEC, according to Deacon.

"DEC systems are damned good," says Bob Duncan, president of storage subsystem maker System Industries, Inc. in Milpitas, Calif. "DEC is doing a great job with their CPUs and are moving into good markets. But you always have to keep one eye open."

DEC, Duncan asserts, could gain a lot more by concentrating its competitiveness on IBM rather than by "trying to stifle the third parties, which are only making [DEC] look good to IBM and IBM's customers."

Some third-party vendors attribute DEC's perceived arrogance to the company's current success.

"DEC is doing extremely well, and that's what has fueled their arrogance and litigious nature," says one executive who requested anonymity because his firm is currently embroiled in litigation with DEC.

John Stadler, executive vice-president at Hopkinton, Mass.-based memory board maker Clearpoint, Inc., agrees. "We're still surviving in the DEC market," he says. "But users, particularly the more knowledgeable ones, are getting fed up with DEC's arrogance."

Tight grip on VAXBI

What rankles Clearpoint most about DEC these days, according to Stadler, is the closed VAXBI architecture. Both Clearpoint and its nearby Hopkinton rival EMC Corp. have been involved in well-publicized attempts to reverse-engineer the BI bus. Clearpoint is selling BI memory boards, but the BI portion of the board is DEC's own chip. The company buys DEC boards and plugs the BI chip into its own offering.

Stadler terms DEC's decision to maintain exclusive hold on the BI architecture "a slap in the face of the third parties." The way he translates the message, "DEC is basically saying, 'You guys can rummage around in the gutter or low-end Q-bus market; we won't take that away from you. But forget about the high-end BI products.' "

It is Stadler's contention that DEC is only hurting itself by keeping a tight hold on the BI bus architecture. "The reality is that the BI has stagnated under DEC. There's very little third-party hardware available for it."

Allen Gronsky, vice-president of terminal marketing at CIE Terminals, Inc. in Irvine, Calif., also sees DEC injuring itself with its get-tough stance in the terminal market. "They've made it tough for us, mostly from a pricing standpoint," he says. "But DEC has not only gotten down and dirty in pricing against the emulators, they've been undercutting their own terminal prices as well."

DEC's latest terminal entry, the VT320, was introduced earlier this year at a list price of just $545, Gronsky notes. "That's less than half the $1,095 price tag that its predecessor, the VT220, initially had."

To keep the company coffers full in the face of DEC's actions, many third-party suppliers are engaging in counteroffensive maneuvers of their own. These include exploring niche markets, introducing value-added and proprietary devices and diversifying into other markets.

At Clearpoint, the shift has been pronounced. Two years ago, Stadler says, 95% of company revenue came from DEC businesses. Now that figure is slightly less than 50%. "We built our company around DEC: All of our people were former DEC employees," he says. "Now we have a lot of ex-Sun people as well as people with Unix and VME experience here. And once you've made that investment, you don't go back."

Stadler says the decision to diversify was not a unilateral one, that in fact the company was really just following its customer base. "Let's face it, there are now a lot of viable alternatives to DEC hardware," he says.

Loyal subjects

On the other hand, CIE, which settled a patent-infringement suit with DEC out of court last August, says it puts its faith in the value-added route.

"Our plan is to come out with feature-rich, price-competitive DEC emulations," Gronsky says, adding that CIE and the other 20 or so vendors currently crowding the DEC terminal market were surprised and pleased when the VT320 turned out to be a " 'me-too'-type product." However, he says he is not eliminating the possibility of eventual diversification.

EMC has pursued a strategy of diversification from its inception six years ago. In addition to DEC's, EMC addresses the markets of Prime Computer, Inc., Wang Laboratories, Inc., IBM, Hewlett-Packard Co. and Data General Corp. More recently, the company has taken diversification a step further. Besides memory products, EMC broadened its product portfolio into storage subsystems and proprietary offerings in the optical market.

EMC, like CIE, also settled a patent-infringement lawsuit with DEC out of court this year. And, also like CIE, the company says the litigation has not caused it to abandon the DEC market.

"The lawsuit was a moot issue long before it was settled and didn't affect the way we do business," Fitzgerald says. "DEC will continue to be a major portion of our business. If anything, DEC's tough policies and its decision to keep the BI bus architecture closed have made us more determined to stay in that market and get products out the door."

EMC is not the only one seeking to open the VAXBI door. System Industries' Duncan says his firm is "actively engaged in reverse-engineering the BI bus." Specifically, he says, his company hopes to introduce its first BI product, a computer port adapter for cluster applications, by next summer.

System Industries recently ended seven years of legal wrangling with DEC on patent issues. And while Duncan claims his firm's relationship with DEC is good, he is determined that it "will be extremely rigorous in documenting new product development" to avoid future legal entanglements.

"WE'RE still surviving in the DEC market. But users are getting fed up with DEC's arrogance."

JOHN STADLER
CLEARPOINT, INC.

Duncan's attitude is born of prudence and the fact that System Industries is wholly DEC-specific and has no current plans to diversify into other markets. For that reason, Duncan says, "We intend to stay light on our feet in DEC dealings." What that means, he says, is maintaining a cost/performance edge over DEC by bringing value-added products to market faster.

Emulex Corp. in Costa Mesa, Calif., derives 50% to 60% of its sales from DEC-related business, but the company says it plans to diversify. According to Larry Tashbook, director of product marketing for storage products, "it is too dangerous not to." At present, Emulex is engaged in two separate, ongoing lawsuits with DEC over alleged theft of trade secrets and patent infringement.

Both System Industries and MDB, meanwhile, say they will make their fortunes by addressing markets and providing solutions that DEC chooses to ignore. Deacon says his company will "identify how to make DEC equipment do things that DEC doesn't do."

There is, Deacon maintains, a lot of money to be made, not just in proprietary product solutions but also in helping users preserve their investment in older systems. For instance, devices such as preprocessing front ends and closely coupled parallel processors enhance and exploit the positive features of DEC's VMS operating system.

Despite a pragmatic wariness of DEC policies, Deacon says MDB enjoys a good relationship with DEC. He says his company is the only U.S. firm with a contract to buy DEC's J-11 chips.

Complement, not compete

Anaheim, Calif.-based Distributed Logic Corp. (Dilog), also an all-DEC third party, says it plans to stay on DEC's good side by providing complementary rather than competitive product offerings.

"Our removable subsystem solves a hardware need that exists in government markets for data security," marketing director Bryan Fifield says, "and that's an area DEC has not addressed."

In the long term, however, Dilog, too, will diversify into other marketplaces. "Two or three years from now, we'd like to see 30% of our sales come from markets other then DEC," Fifield says. "We have to diversify to grow."

Like Dilog, Beaverton, Ore.-based Tektronix, Inc., one of the largest terminal manufacturers, enjoys a complementary relationship with DEC.

"We're a DEC cooperative marketing partner," states Tom Long, vice-president of Tektronix's design automation group. "DEC is a big organization and sometimes a bit bureaucratic, but we're guessing that they'll gain market share in the mid-range to high-end portion of the workstation market."

Tektronix's computer-aided engineering business is 70% DEC — vs. 30% Apollo — and, Long observes, "Those numbers aren't changing rapidly. Our profit margins in the DEC market are probably better than they were two years ago, but I doubt our relationship would be this good if DEC were more of a competitor with Tektronix."

Past favors

Overall, third-party vendors remain committed and even optimistic about their business prospects in the DEC market, although most express the desire to see DEC "lighten up."

"DEC seems to have forgotten that it was third-party suppliers that enhanced their position and helped to popularize the Q-bus and the LSI and VAX systems," says one vendor who asked not to be identified.

"If they keep up the harassment," he notes, "they may find that the next time they debut a product with limitations, the third-party vendors won't be around to help them out of the jam." •

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Optical disk storage systems

Aquidneck Systems International, Inc.
(401) 295-2691
Optical Archiving Systems
Plug-compatible tape-emulation systems based on optical technology. Connect directly to industry-standard interface tape couplers. Three modes of operation accommodate the transition from tape storage to disk-based storage.

ATG Gigadisc
(617) 935-2770
GD 1001
A 2G-byte, 12-in. write-once read-many optical disk drive with an internal and external small computer systems interface. Includes laser and optical heads. Can access records either randomly or sequentially. Features a read/write transfer rate of 478K bit/sec.

Aviv Corp.
(617) 933-1165
Optical Disk Storage System Model OSS 2000
An optical disk-based storage and retrieval system. Up to 1.02G bytes of data per side can be stored on a 12-in. disk. One disk can store up to 7,000 reels of tape or tape images on each side.

EMC Corp.
(800) 222-EMC2
Archeion
An optical disk storage system. Supports up to 56G bytes of on-line storage and offers four concurrent data transfer modes. All interfaces are industry standard and VAX compatible.

Fujitsu America, Inc.
(408) 432-1300
M2505 Optical Disk Drive
A 5¼-in. write-once optical disk drive. Includes archival data storage, software and data distribution and fixed-disk applications. Offers data transfer rate of 694K bit/sec.

Hitachi America, Ltd.
(415) 872-1902
301 series Optical Disk Subsystem
Provides 1G byte of write-once storage capacity. Basic configuration combines formatter controller with one to four disk units, providing up to 2.6G bytes of storage per disk. Library configuration offers up to 809G bytes of storage, incorporating a formatter controller with software, one or two disk units and an automatic changer for up to 32 disk cartridges.

OD101
A write-once storage device incorporating a 5¼-in. drive with 600M bytes of storage per disk (both sides). Basic configuration combines formatter controller with one to four drives.

Information Storage, Inc.
(303) 579-0460
525WC
A 5¼-in. write-once read-many optical disk drive that stores 115M bytes of user-writable data per side on certified media. Acts as a hard-disk extender, an on-line archiver and backup with permanent data storage.

525GB
A 5¼-in. write-once read-many disk holding 1G byte of user-writable data on a single removable cartridge. Average access time is 90 msec, and data transfer rate is 6.5M bit/sec.

Laserdrive Ltd.
(408) 970-3600
Model 810
A 5¼-in. optical storage system with more than 810M bytes of storage on an ANSI-standard, double-sided cartridge. Able to plug-and-play with any operating system through magnetic disk drive emulation.

Optimem
(415) 961-1800
Optimem 1000
An optical drive using write-once laser technology and write-once digital data. Can store 2G bytes. Pregrooved for servo-tracking and formatted with sector address information.

Optotech, Inc.
(303) 570-7500
VAX Laser Data Bank
A plug-and-play optical storage system for the DEC Microvax II. Using write-once read-many technology, a 5¼-in. disk offers 200M-byte user capacity on each side of optical disk cartridge. Supports DEC VAX/VMS with file interchange capabilities to Sun Microsystems, Inc., IBM Personal Computer and Apple Computer, Inc. Macintosh architectures.

Sony Corp. of America
(201) 930-1000
WDD-3000 Optical Disk Drive, WDA-3000-10 Optical Disk Autochanger
Provides up to 3.2G bytes of removable data storage on write-once optical disks. Can be interfaced to DEC Q-bus and Unibus systems running under VMS. Up to eight drives can be daisychained on a single port. A jukebox configuration is also available, with up to 164G bytes of storage with a 7-msec access time.

Qualogy, Inc.
(408) 434-5200
QLC-1000
Available in 5¼- and 12-in. write-once read-many optical disks. Stores from 400M to 2.4G bytes on a single disk; offers 64K bytes of random-access memory cache. Uses Digital Equipment Corp.'s TMSCP for all I/O commands. Offers small computer systems interface.

U.S. Design Corp.
(301) 577-2880
VOS I/VOS II/Juke VOS
Three optical storage products for both DEC Q-bus and Unibus processing systems. VOS I and VOS II support single- or multiple-drive configurations with storage for 800M to 18G bytes. Juke VOS provides support for multiple jukebox systems, each storing up to 164G bytes. The optical disk conforms to DEC's Files-11 structure.

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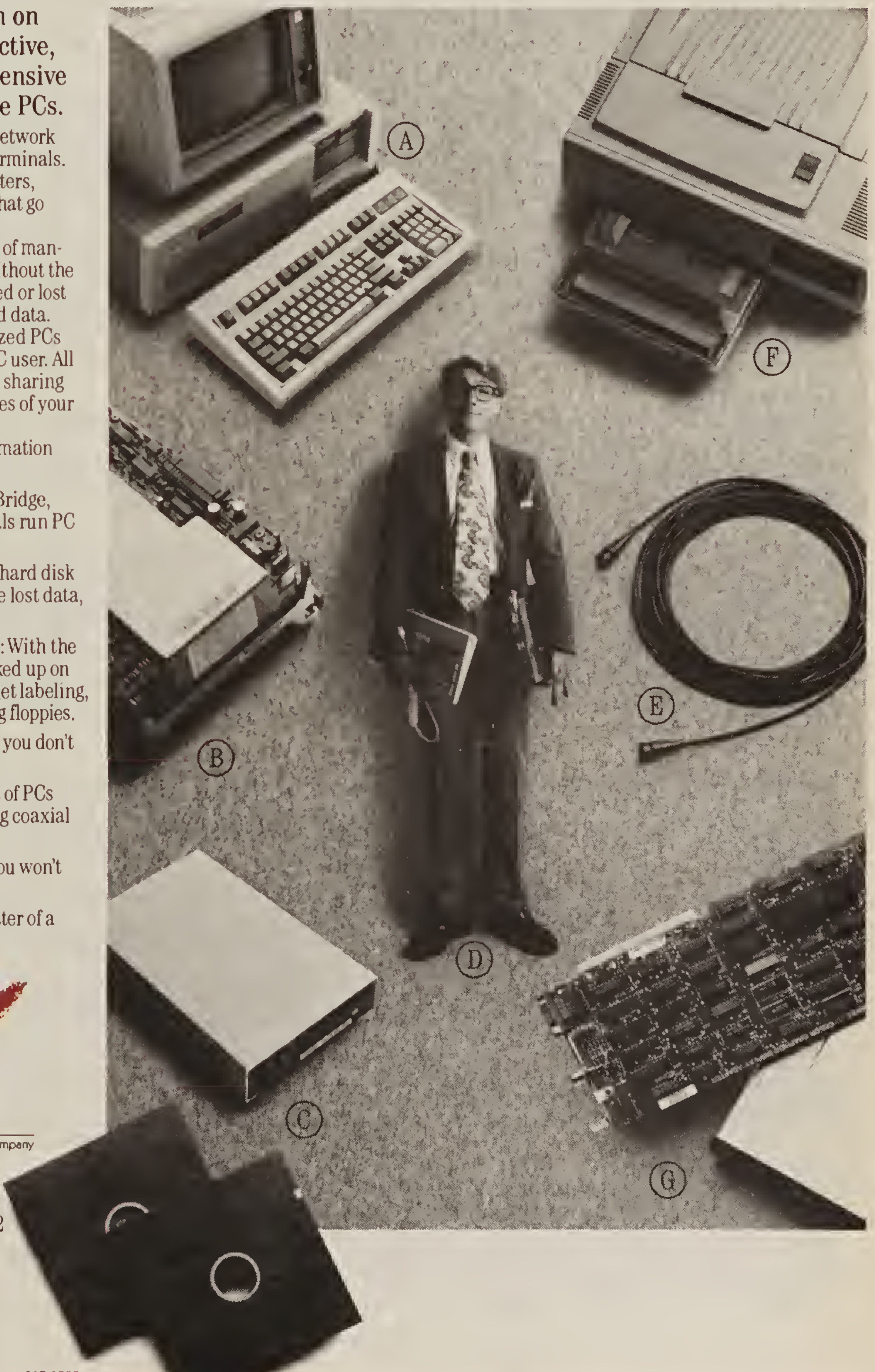

DEC-compatible terminals

COMPANY	PRODUCT	RESIDENT DEC EMULATION MODES	DEC KEYBOARD COMPATIBILITY	DISPLAY CAPACITY	MEMORY CAPACITY	SCREEN AREA	COLOR OR MONOCHROME	GRAPHICS CAPABILITIES	SPLIT SCREEN	NUMBER OF PROGRAMMABLE FUNCTION KEYS	DOWNLOADABLE CHARACTER SETS	TRANSMISSION MODE(S)	FORMAT MODE(S)	CHARACTER CODE STANDARD(S) SUPPORTED	BIT/SEC. RATE	PRICE
Ampex Corp. Computer Products Division (213) 640-0150	Ampex 220	VT220, VT100, VT52	Yes	80 or 132 col. x 24 lines	4 pages	14 in.	Monochrome	No	Yes	32	Yes	Full duplex	Block	ANSI	50 - 19.2K	$529
Ann Arbor Terminals, Inc. (313) 663-8000	Genie XL	VT100, VT52	No	80 col. x 18 to 30 lines	2 pages	15 in.	Monochrome	No	No	32	Yes	Full and half duplex	Block, line, character	ANSI	300-19.2K	$1,395
	Ambassador XL	VT100, VT52	No	80 col. x 18 to 60 lines	2 pages	15 in.	Monochrome	No	No	32	Yes	Full and half duplex	Block, line, character	ANSI	300 - 19.2K	$1,595
	Ambassador GXL	VT100, VT52	No	80 col. x 18 to 60 lines	2 pages	15 in.	Monochrome	Yes	No	32	Yes	Full and half duplex	Block, line, character	ANSI	300 - 19.2K	$3,090
	VXL	VT100, VT52	No	80 or 160 col. x 36 to 60 lines	2 pages	15 in.	Monochrome	No	Yes	32	Yes	Full and half duplex	Block, line, character	ANSI	300 - 19.2K	$2,795
	Guru XL	VT100, VT52	No	40 to 162 col. x 36 to 66 lines	2 pages	15 in.	Monochrome	No	No	32	Yes	Full and half duplex	Block, line, character	ANSI	300 - 19.2K	$2,395
Atlantic Research Corp. Tempest Division (703) 471-2200	T5152	VT220, VT102, VT101, VT100, VT52	Yes	80 col.	—	14 in.	Monochrome	Yes	Yes	36	Yes	Full duplex	—	ASCII	300 - 38.4K	$2,450
AT&T (800) 247-1212	615 MT	VT220, VT100, VT52	Yes	1,920 char.	1 page	14 in.	Monochrome	No	Yes	36	No	Full duplex	Character	ANSI, ASCII	To 19.2K	$945
	610 BCT	VT220, VT100, VT52	Yes	1,920 char.	1 page	14 in.	Monochrome	No	Yes	16	No	Full duplex	Character	ANSI	To 19.2K	$945
Calcomp, Inc. (800) CAL-COMP	The Vistagraphic 4500MV	VT100	Yes	1,280 x 96 char.	—	19 in.	Color	Yes	—	—	—	—	—	ASCII	19.2K	$29,375
Cardinal Technologies, Inc. (800) 233-0187	The APT series	VT52	No	80 col. x 24 lines	1 page	9 to 29 in.	Monochrome	Ltd.	No	8	No	Full and half duplex	Character	ASCII	110 - 9.6K	$498-$798
CIE Terminals, Inc. (800) 854-3322	CIT101XL	VT100, VT52	Yes	80 or 132 col.	4 pages	14 in.	Monochrome	No	No	32	No	Full and half duplex	Block, line, character	ANSI, ASCII	150 - 38.4K	$699
	CIT326	VT220	Yes	80 or 132 col.	4 pages	14 in.	Monochrome	No	Yes	45	No	Full and half duplex	Block, line, character	ANSI, ASCII	75 - 19.2K	$595
Datamedia Corp. (800) DMC-INFO	Colorscan/2	VT240, VT200, VT100	Yes	4,488 char.	—	14 in.	Color	Yes	No	24	Yes	Full and half duplex	Line, character	ANSI, ASCII	38.4K	$2,000
Datawatch Corp. (617) 932-0550	Datawatch 220 Tempest Terminal	VT220	Yes	80 or 132 col. x 24 lines	—	14 in.	Monochrome	Yes	Yes	15	Yes	Full duplex	Character	ASCII	To 19.2K	$2,295
	Datawatch 240 Tempest Terminal	VT240	Yes	80 or 132 col. x 29 lines	—	14 in.	Monochrome	Yes	Yes	15	Yes	Full duplex	Character	ASCII	—	$2,995
	Datawatch 241 Tempest Terminal	VT241	Yes	29 lines; 80 or 132 col.	—	14 in.	Color	Yes	Yes	15	Yes	Full duplex	Character	ASCII	To 19.2K	$5,495
Davox Corp. (617) 667-4455	Series 4900/5900	VT220, VT100, VT52	Yes	132 col. x 24 lines	256K bytes	12 in.	Monochrome, color	No	Yes	168	Yes	Full duplex	Character	ANSI, ASCII	400K	$2,695, $2,995
Delta Data Systems Corp. (301) 290-6400	DD220T Tempest VDT	VT220	Yes	80 col. x 24 lines	—	14 in.	Monochrome	No	Yes	36	No	Full duplex	—	ASCII	To 19.2K	$2,745
Direct Service & Repair (408) 980-1414	DT9220	VT220, VT100	Yes	24, 25, or 26 lines	—	14 in.	Monochrome	Yes	No	13	Yes	Full and half duplex	Block, line, character	ANSI, ASCII	150 - 38.4K	$595
	Direct 831	VT100	Yes	24, 25, or 26 lines	—	14 in.	Monochrome	Yes	No	13	Yes	Full and half duplex	Block, line, character	ANSI, ASCII	150 - 38.4K	$1,195-$1,295
Esprit Systems, Inc. (800) 645-4508	Opus 220	VT220	Yes	80 col. x 24 lines	2 pages standard, 4 pages optional	14 in.	Monochrome	No	Yes	36	Yes	Full and half duplex	Character	ASCII	75 - 38.4K	Price not available
	ESP-6515	VT220	Yes	80 col. x 24 lines	2 pages standard, 4 pages optional	14 in.	Monochrome	No	Yes	36	No	Full and half duplex	Character	ASCII	75 - 38.4K	Price not available
Falco Data Products, Inc. (800) 835-8765	5220E	VT220	Yes	80 or 132 col.	4 or 7 pages	14 in.	Monochrome	Yes	Yes	16	Yes	—	Block, character	ANSI	38.4K	$595
	5000	VT220, VT131, VT100, VT52	Yes	80 or 132 col. x 25 to 50 lines	15 pages	14 in.	Monochrome	Yes	Yes	12 or 16	Yes	—	—	ANSI, ASCII	50 - 38.4K	$800
Falco Data Products, Inc. (800) 835-8765	500E	VT52, VT100, VT131, VT220	Yes	80 or 132 col. x 25 to 50 lines	7 pages	14 in.	Monochrome	Yes	Yes	12 or 16	Yes	—	—	ANSI, ASCII	50 - 38.4K	$650
Graphon Corp. (800) GRAPHON	GO-200 series	VT52, VT100, VT220	Yes	132 col. x 26, 52 lines	8, 16 or 32 pages	14 in.	Monochrome	Yes	Yes	45	Yes	Full and half duplex	Character	ANSI	19.2K or 57.6K	$795-$2,495
	GO-400 series	VT52, VT100, VT220	Yes	132 col. x 48 lines	16 or 32 pages	14 in.	Color	Yes	Yes	60	Yes	Full and half duplex	Character	ANSI	57.6K	$2,995-$5,995

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from the vendors.

COMPANY	PRODUCT	RESIDENT DEC EMULATION MODES	DEC KEYBOARD COMPATIBILITY	DISPLAY CAPACITY	MEMORY CAPACITY	SCREEN AREA	COLOR OR MONOCHROME	GRAPHICS CAPABILITIES	SPLIT SCREEN	NUMBER OF PROGRAMMABLE FUNCTION KEYS	DOWNLOADABLE CHARACTER SETS	TRANSMISSION MODE(S)	FORMAT MODE(S)	CHARACTER CODE STANDARD(S) SUPPORTED	BIT/SEC. RATE	PRICE
Hewlett-Packard Co. (800) 367-4772, dept. 761A	HP 700/22 Display Terminal	VT220, VT100, VT52	Yes	80 or 132 col. x 24 lines	4 pages	14 in.	Monochrome	—	—	30	—	—	—	ANSI, ASCII	75 - 38.4K	$575
Honeywell Bull, Inc. (617) 671-6000	HDS 3	VT220, VT100, VT52	Yes	80 or 132 col. x 25 lines	1 page	14 in.	Monochrome	Yes	No	15 in DEC mode, 16 in ASCII mode	No	Full duplex	Block, character	ANSI, ASCII	38.4K	$750
Human Designed Systems, Inc. (800) HDS-1551	HDS 3200	VT220, VT100, VT52	Yes	1,920 x 3,168 char.	4 pages	15 in.	Monochrome	Yes	Yes	126	Yes	Full and half duplex	Character	ANSI, ASCII	38.4K	From $699
Kimtron Corp. (408) 436-6550	KT-22	VT220, VT100, VT52	Yes	80 or 132 col.	2 or 3 pages	14 in.	Monochrome	Yes	No	30	Yes	Full and half duplex	Character	ANSI	50 - 38.4K	$599
	KT-22/PC with dual-host capability	VT220, VT100, VT52	Yes	80 or 132 col.	2 or 3 pages	14 in.	Monochrome	Yes	Yes	30	Yes	Full and half duplex	Character	ANSI	50 - 38.4K	$749
	KT-22/ Advanced	VT220, VT100, VT52	Yes	80 or 132 col.	2 or 3 pages	14 in.	Monochrome	Yes	Yes	30	Yes	Full and half duplex	Character	ANSI	50 - 38.4K	$749
IBM Contact local IBM sales office	3151 ASCII Display Station (Models 310 & 410)	VT220, VT100, VT52	Yes	80 or 132 col. x 25 lines	1 page	14 in.	Monochrome	No	Yes	15 or 36	Yes	Full and half duplex	Character, echo, block	ANSI, ASCII	50 - 38.4K	$575
Intecolor Corp. (404) 449-5961	Colortrend 210	VT100	Yes	80 col. x 24 lines	1 page	14 in.	Color	No	No	12	No	Full and half duplex	Character	ANSI, ASCII	110 - 19.2K	$1,395
	Colortrend 220	VT220	Yes	80 col. x 25 lines	1 page	14 in.	Color	No	No	24	Yes	Full and half duplex	Character	ANSI, ASCII	110 - 19.2K	$1,695
	Colortrend 4100, Model 100	VT100	Yes	80 col. x 30 lines	2 to 16 pages	14 in.	Color	Yes	Yes	100	Yes	Full and half duplex	Character	ANSI, ASCII	110 - 38.4K	$1,995
Liberty Electronics USA, Inc. (415) 742-7040	Freedom One Turbo	VT220, VT100, VT52	Yes	80 or 132 col. x 24 lines	1 page	14 in.	Monochrome	Yes	Yes	44-88	Yes	Full and half duplex	Block, line, character	ANSI	50 - 38.4K	$599
	Freedom One ANSI	VT220, VT100, VT52	Yes	80 or 132 col. x 24 lines	1 page	14 in.	Monochrome	Yes	Yes	44-88	No	Full and half duplex	Block, line, character	ANSI	50 - 38.4K	$499
Link Technologies, Inc. (415) 651-8000	MC3	VT100	No	80 col. x 44 lines	6 pages	14 in.	Monochrome	No	Yes	20, 32 or 38	Yes	Full and half duplex	Block, character	ANSI	50 - 38.4K	$565-$1,725
	MC10	VT220, VT100, VT52	Yes	80 or 132 col. x 44 lines	8 pages	14 in.	Monochrome	Optional	Yes	32 or 38	Yes	Full and half duplex	Block, line, character	ANSI, ASCII	To 38.4K	$599
	Link 220	VT220, VT100, VT52	Yes	Up to 132 col. x 26 lines	2 pages standard, 6 optional	14 in.	Monochrome	No	Yes	38	Yes	Full and half duplex	Block, line, character	ANSI	To 38.4K	$595
Northern Telecom, Inc. (800) 558-9936	Displayphone 220	VT220, VT100, VT52	No	1,920 char.	2 pages	9 in.	Monochrome	Yes	No	32	No	Full and half duplex	Character	ANSI	75 - 19.2K	$895-$1,095
Oyster Terminals Ltd. (213) 395-4774	The Oyster Terminal Family	VT100	Yes	80 char. x 16 lines	1	9½ in.	Monochrome	Yes	No	45	Yes	Full and half duplex	Character	ASCII	75 - 19.2K	$995
Qume Corp. (800) 223-2479	QVT 203 PLUS	VT220	Yes	80 or 132 col. x 25 lines	2 or 4 pages	14 in.	Monochrome	No	Yes	15	Yes	Full and half duplex	Block, line	ANSI, ASCII	To 38.4K	$575
	QVT 212 GX	VT100	No	80 col. x 24 lines	1 page	14 in.	Monochrome	Yes	Yes	4	No	Full and half duplex	Line	ANSI, ASCII	To 19.2K	$995
Ramtek Corp. (408) 988-2211	4660	VT220, VT100	Yes	80 col.	NA	19 in.	Color	Yes	Yes	18	Yes	Serial or parallel	NA	ASCII	To 38.4K	From $20,000
	4322	VT220, VT100	Yes	80 col.	4M bytes	15 in. standard, 19 in. optional	Color	Yes	Yes	18	Yes	Serial or parallel	NA	ASCII	To 38.4K	From $8,995
	4327	VT220, VT100	Yes	80 col.	4M bytes	15 in. standard, 19 in. optional	Color	Yes	Yes	18	Yes	Serial or parallel	NA	ASCII	To 38.4K	From $15,995
Random Corp. (513) 825-0880	Colleague Portable Terminal, Colleague Portable Terminal Plus	VT228, VT220, VT100, VT52	Yes	80 col. x 25 lines	25 pages	10 in.	Monochrome	No	No	20	No	Full and half duplex	Character	ANSI, ASCII	150 - 19.2K	$995, $1295
Relisys (408) 945-1062	RA220E	VT220	Yes	80 col. x 25 lines	1 page	14 in.	Monochrome	No	No	15	Yes	Full duplex	Block	ANSI	9.6K	$695
Systerm, Inc. (519) 884-3440	KD6220	VT220	Yes	80 or 132 col. x 24 lines	1 page	14 in.	Monochrome	No	Yes	14	Yes	Full and half duplex	Block, line, character	ANSI	To 19.2K	$595
Tatung Co. of America, Inc. (213) 637-2105	TVT 7261	VT100, VT52	Yes	80 col. x 25 lines	2 or 4 pages	14 in.	Monochrome	No	Yes	24	Yes	Full and half duplex	—	ASCII	75 - 19.2K	$650
Tektronix, Inc. (503) 682-3411	4200 graphic terminal family	VT220, VT100, VT52	Yes	2,400 or 2,560 char.	7, 11 or 21 pages	13 or 19 in.	Color	Yes	No	12 or 20	Yes	Full and half duplex	—	ASCII, EBCDIC	38.4K	$2,500-$6,995
Televideo Systems, Inc. (408) 745-7760	9220	VT220, VT100, VT52	Yes	80 or 132 col. x 24 lines	1 page	14 in.	Monochrome	No	Yes	30	Yes	Full duplex, half duplex, and local	Character	ANSI	To 19.2K	$619
Teleray Division of Research, Inc. (612) 941-3300	Teleray Model 20-DDG	VT220, VT100, VT52	Yes	3,168 char.	2 pages	14 in.	Monochrome	Yes	Yes	20	Yes	Full and half duplex	Block, line, character	ANSI, ASCII	To 19.2K	$895
	Teleray Model 20-DHP	VT220, VT100, VT52	Yes	3,168 char.	4 or 8 pages	14 in.	Monochrome	Yes	Yes	32	Yes	Full and half duplex	Block, line, character	ANSI, ASCII	To 19.2K	$895
Texas Instruments, Inc. (800) 527-3500	Travelmate 1200 Portable	VT100, VT52	No	80 col. 16 lines	44K bytes	11.7 in.	Monochrome	No	No	—	No	Full and half duplex	Character	ASCII	300 - 1,200	$1,295

COMPANY	PRODUCT	RESIDENT DEC EMULATION MODES	DEC KEYBOARD COMPATIBILITY	DISPLAY CAPACITY	MEMORY CAPACITY	SCREEN AREA	COLOR OR MONOCHROME	GRAPHICS CAPABILITIES	SPLIT SCREEN	NUMBER OF PROGRAMMABLE FUNCTION KEYS	DOWNLOADABLE CHARACTER SETS	TRANSMISSION MODE(S)	FORMAT MODE(S)	CHARACTER CODE STANDARD(S) SUPPORTED	BIT/SEC. RATE	PRICE
Unisys Corp. (215) 542-2240	UVT 1224	VT220, VT100	Yes	80 or 132 col. x 25 lines	1 page	14 in.	Monochrome	Yes	No	20	Yes	Full and half duplex	Block, character	ASCII	To 38.4K	$695
Visual Technology, Inc. (617) 459-4903	The Visual 603	VT220	Yes	80 or 132 col. x 25 or 50 lines	1 page	14 in.	Monochrome	Yes	Yes	30	Yes	Full duplex	Character	ASCII	50 - 38.4K	$695
	The Visual 630	VT220	Yes	80 or 132 col. x 25 or 50 lines	80 pages	14 in.	Monochrome	Yes	Yes	30	Yes	Full duplex	Character	ASCII	50 - 38.4K	$995
Wyse Technology, Inc. (800) GET-WYSE	WY-85	VT220	Yes	132 col. x 25 lines	1 page	14 in.	Monochrome	Yes	Yes	15 or 30	Yes	Full and half duplex	Block, line, character	ANSI	To 38.4K	$599
Zentec Corp. (408) 727-7662	ADM 220	VT220	Yes	1,920 or 3,168 char.	1 page	12 or 14 in.	Monochrome	No	Yes	15	No	Full duplex	Character	ANSI	To 19.2K	$895

VENDOR VIEWPOINT

OEM service gets creative

BY BRIAN FITZGERALD

Citing higher performance, better reliability, lower costs and the ability to extend the useful life of existing computing resources, many MIS managers turn to third-party vendors — rather than the original manufacturer — for system upgrades and enhancements.

At the same time, however, these managers look at third-party products cautiously, because multivendor systems also raise valid concerns regarding product service and support.

Who, for example, is responsible in the event of a system breakdown if third-party peripherals or system enhancement products share the same diagnostics as the original mid-range or mainframe computer? Will the MIS manager have to make endless phone calls to solve the problem? Will finger-pointing between the original computer manufacturer and third-party vendor cause excessive system downtime or extra expense from unneeded service calls?

For a vendor to be accepted in this situation — no matter how good the product — it must first prove its ability to supply comprehensive, hassle-free service and support. And this support must be provided in a way that complements rather than conflicts with the user's existing service policy.

Dealing in the DEC world

Digital Equipment Corp. users have a reputation for incorporating third-party peripherals and enhancement products into their systems.

Despite its size and the extent of third-party market activity it has engendered, DEC is the only major minicomputer manufacturer without a formal, published policy regarding multivendor systems. Consequently, the burden of proof in a multivendor DEC system is always on the third-party vendors.

Service requirements for DEC users can be broken into four demands:

- Users must be able to initiate service with just one phone call, without first having to determine the source of the problem.
- Users must not be held liable for any costs incurred from a DEC service call in which the faulty product was not covered by the DEC service policy.
- In no instance should finger-pointing occur.
- System mean time to repair must be kept to a minimum if the third-party product is at fault.

Innovation is the key

To compete in the DEC market, some third-party vendors devise creative service arrangements that fulfill these demands and eliminate the uncertainties that often accompany multivendor DEC systems. Some, for example, have a policy of reimbursing users for any costs incurred from a DEC service call in the event the add-in product is at fault. This policy gives users the freedom to call DEC when a problem occurs and also provides them with a one-phone-call solution, without having to determine the source of the problem.

To any prevent finger-pointing between DEC and the third-party vendor, some provide a "customer is always right" policy. This entails backing up all products with a lifetime warranty guaranteeing no-cost replacement. If the user suspects a problem with an add-in product, one phone call ensures a replacement will be shipped overnight with no questions asked.

Because of their success, many of these third-party service innovations have become industry-standard policies. By offering creative service and support solutions, rather than engaging in head-on conflicts with major minicomputer manufacturers, third-party vendors can provide an intelligent alternative that helps MIS managers extend the useful life of existing computer resources. •

Fitzgerald is manager of corporate communications at EMC Corp.

Interview

CONTINUED FROM PAGE S9

nobody is happy, but I believe it is a closed issue. It's not an area in which we are saying, "Should we redo this?" We're pretty satisfied with the direction we've taken.

Third-party peripherals don't seem to be welcome anymore. How serious is DEC about supporting and servicing third-party peripherals inside DEC shops?

There is an exclusive service policy that provides different categories of peripheral support. It is a business policy that allows local branches to make decisions based on their ability to provide adequate support. But that program has been under way for several years now.

Is the quality of service lower for third-party equipment than for DEC equipment?

Because it is not our equipment, it has obviously not been designed to the same standards. It doesn't have all the maintenance features in the hardware. It doesn't have all the diagnostic software. It doesn't have the support centers in Colorado. We didn't develop the product with Digital technologies and service methodologies. So there are fundamental limitations as to what can be done, just because it is not our product. But within that, certainly our objective is to provide quality service.

So there shouldn't be that perception of inferior service?

In fact, since we can't bring all those other technologies to bear on the product, it may end up that it takes longer to fix them.

There is a sense among third parties that DEC would do better working hand-in-glove with them in competing against IBM. What's your opinion?

That's a different business strategy. In many regards, we do a lot of that. But not everywhere. We decide who we're going to work with.

Can you give me an update on the lawsuits in the terminal area?

We have certain intellectual property rights, and if somebody takes one of our products and runs it through a Xerox machine, we think we have some rights there. We don't think that's playing the game fairly.

DEC has started some pretty aggressive pricing in the peripherals area. Is the intent to drive out some of the third parties?

Our intention is not to drive out anybody. Our intention is to be competitive.

Optical disks seems to be an area of particular concern for users. Why do users feel that promises have been made but nothing delivered?

I was surprised at the quote [in *Computerworld Extra*] that DEC has been promising something for four or five years. I don't think we've been working on optical disk for four or five years. The bottom line is that we're committed to optical. We brought the first CD-ROM to the marketplace. We had an absolute clear first there in bringing it in a systems environment (see story page S8). It has taken a long time to get moving, and it's just starting to move now.

People always felt a certain way about DEC, that it was a very accessible place. The boundaries between customers and engineers and third parties were gray. Now, as DEC has gotten bigger, that has changed. It probably had to change, but that frustrates people who say, "Oh, it's not good old DEC anymore."

We're trying to segment it and deal with the historical folks who have been great, loyal customers and also be very successful with the pinstripe suit in the MIS department. So, in fact, there's some segmentation there. I think people have to understand that.

When you go to DECUS, it seems to me that it's still fairly engineering-oriented. There's a very technical interchange. It seems to me that, because we try and do more in some other dimension, we get hung with this bum rap about walking away from everybody else. There is certainly no desire to walk away from what is an extremely important customer base to us. But it may be that since it is a *piece* of the whole, rather than the whole, people see it that way. •

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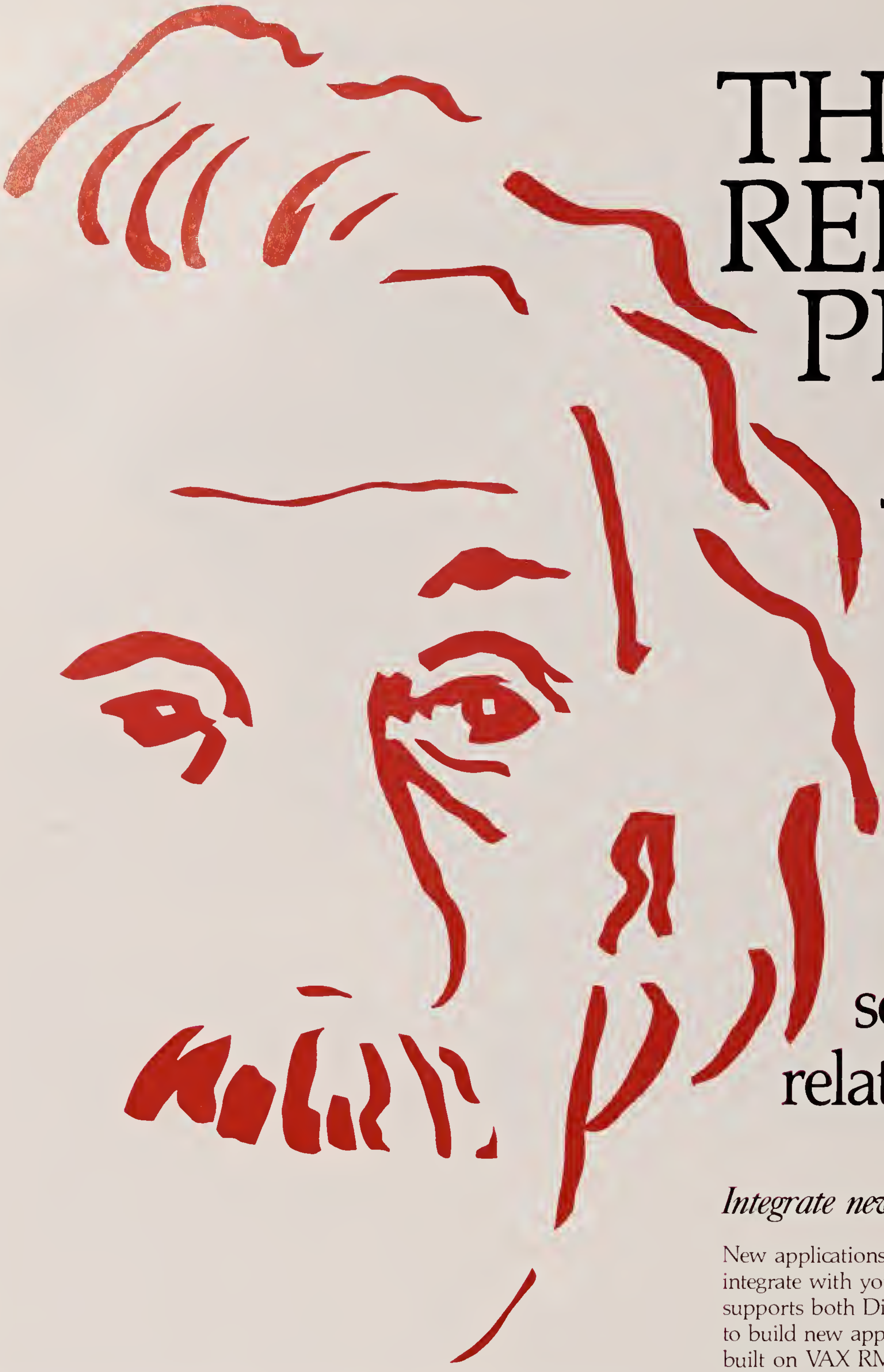

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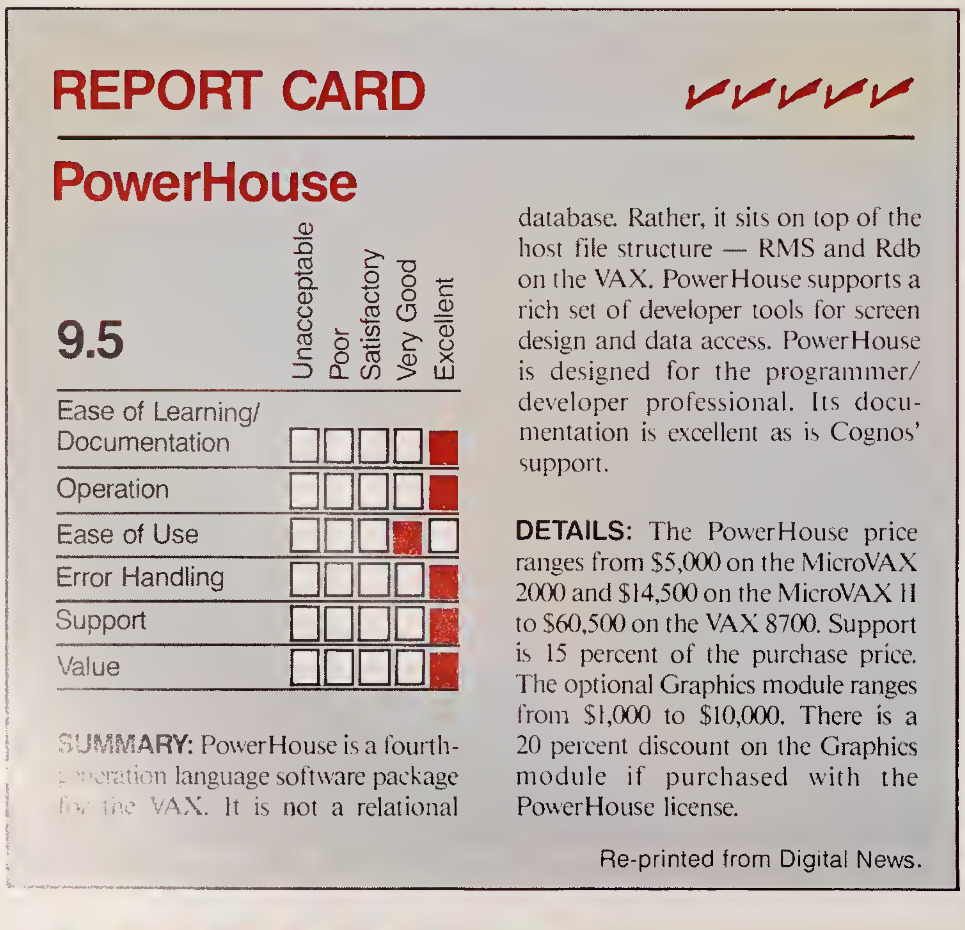

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9.5	Unacceptable	Poor	Satisfactory	Very Good	Excellent
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Operation	☐	☐	☐	☐	■
Ease of Use	☐	☐	☐	■	☐
Error Handling	☐	☐	☐	☐	■
Support	☐	☐	☐	☐	■
Value	☐	☐	☐	☐	■

SUMMARY: PowerHouse is a fourth-generation language software package for the VAX. It is not a relational database. Rather, it sits on top of the host file structure — RMS and Rdb on the VAX. PowerHouse supports a rich set of developer tools for screen design and data access. PowerHouse is designed for the programmer/developer professional. Its documentation is excellent as is Cognos' support.

DETAILS: The PowerHouse price ranges from $5,000 on the MicroVAX 2000 and $14,500 on the MicroVAX II to $60,500 on the VAX 8700. Support is 15 percent of the purchase price. The optional Graphics module ranges from $1,000 to $10,000. There is a 20 percent discount on the Graphics module if purchased with the PowerHouse license.

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SYSTEMS & PERIPHERALS

HARD TALK

James Connolly

New features, old strategies

The talk of differentiation is echoing in the world of IBM again, as MIS managers and analysts wait once more for IBM to provide the functional advantage that sets its 3090 mainframes apart from the older but cheaper IBM 3080 series of large systems.

It is true that the features most analysts expect to be offered with the newest family of 3090s early next year will help differentiate the machines from the 3080s. Those enhancements are expected to include a new version of MVS/XA and enhanced I/O subsystems.

However, there are points to be made in defense of IBM's failure to provide massive feature enhancements with the first two generations of 3090s.

First, IBM phased in functional enhancements to the 3090 during its first two years of availability. For example, I/O channel speeds were boosted from 3M to 4.5M byte/sec. for 3090s in September, and IBM has promoted use of its expanded storage and vector-processing features, which are available only with 3090s.

Second, it should be remem-

Continued on page 74

Clouds clear for Sun 4 arrival

Wall Street firm says Sparc-based workstation exceeds expectations

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc.'s first workstation based on its Scalable Processor Architecture (Sparc) recently reached its first customers. So far, the Sun 4 seems to meet customers' expectations, according to industry observers.

"It's exceeding expectations," said Jonathan Fram, an industry analyst with Bear, Stearns & Co., a Wall Street investment banking firm that is a Sun user. "There were rumors of overheating and hardware failures, but that hasn't been the case."

Sun claimed the new workstation performs 2½ times better than the Sun 3, which is based on Motorola, Inc.'s 68020 microprocessor. Fram said Bear Stearns found the Sun 4 performing three to five times faster than its predecessor.

In addition, Sun claimed the Sun 4 processed 10 million instructions per second (MIPS) in a benchmark based on an integer-intensive test. According to Fram, the Sun 4 has exceeded the 10-MIPS mark in integer-intensive applications performed at his firm.

Others also appear satisfied. "It is certainly meeting our expectations," said a spokesman for Valid Logic Systems, Inc., which is considering the Sun 4 as a platform for its computer-aided engineering and design software. He declined to elaborate.

Finding the Sun 4 exceeding the 10-MIPS mark might be the exception rather than the rule for the workstation, industry experts said. "It's obviously not a 10-MIPS machine in most applications," said Robert Herwick, an industry analyst with Hambrecht & Quist, Inc. "In pure integer mode, it's a 10-MIPS machine, but when you're talking about floating-point or I/O-intensive applications, it's more like 5 or 6 MIPS."

Gamble paying off?

If preliminary reactions are any indication, Sun's Sparc gamble may succeed once the Sun 4 becomes widely available early next year. After basing its products on Motorola microprocessors, Sun developed Sparc. Continuing with its open systems philosophy, Sun is offering licenses to the technology. So far, AT&T and Xerox Corp. have jumped on the Sparc bandwagon.

Sun's move to Sparc is an attempt to push its performance to greater heights. "As you go into the 10-MIPS area, you have to go to a nontraditional microprocessor," said David Wu, an industry analyst at S. G. War-

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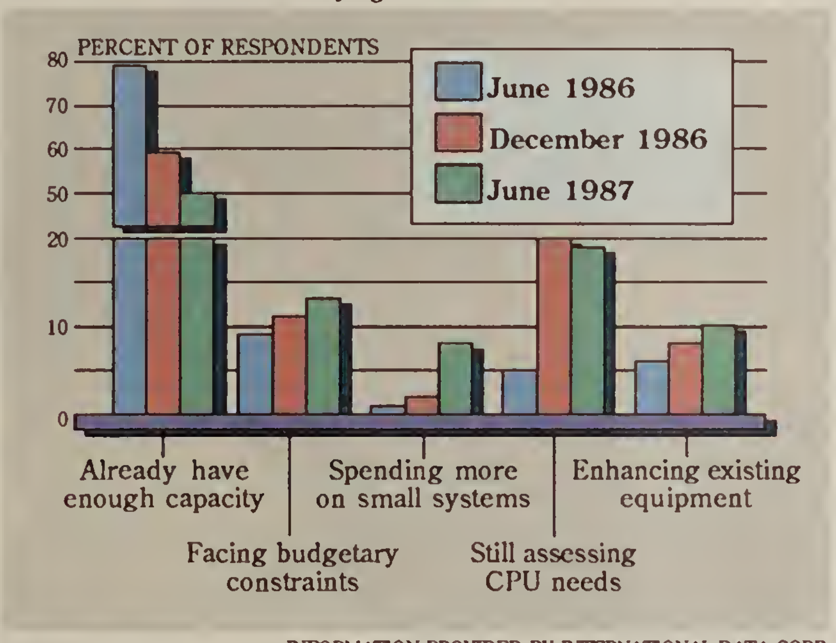
Data View

CPU overflow

Sufficient capacity is the key reason cited by users for not buying IBM 3090s



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Zitel drive ups speed, saves space

MILPITAS, Calif. — Zitel Corp. last week claimed faster response times and floor-space savings with the introduction of a disk subsystem designed for use with Unisys Corp. mainframes.

Zitel pitted its Kwikcache against the Unisys 9494-24 and MD8-4 and positioned it for use with Unisys V, A and B series mainframes.

Zitel claimed reduced seek times and reduced rotational latency delays through the use of features including directory cache, look-ahead buffering and data caching.

Each of the up to eight drives in the subsystem has a dedicated buffered controller, which Zitel said should eliminate the rotational position sensing delays in which the head waits over the target sector for a full platter rotation of 16.6 msec.

Kwikcache provides a data transfer rate of 2.46M byte/sec., a rotational speed of 3,600 revo-

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Inside

- Kanematsu-Gosho offers IBM-compatible laser printer. Page 71.
- HP adds to OEM disk drive line. Page 71.
- IBM expands support for ASCII, channel-attached devices. Page 76.

Disk mirroring highlights Datapoint intros

BY STANLEY GIBSON
CW STAFF

SAN ANTONIO — Datapoint Corp. recently claimed improved reliability and file server performance with the introduction of disk mirroring for use with its RMS/XA operating system.

Disk mirroring was among a series of Datapoint announcements, which included a disk drive, a Cobol workbench and electronic mail capabilities under Microsoft Corp.'s MS-DOS.

Disk mirroring creates logical disks that can copy a user's data files. In Datapoint's disk mirroring, it is not necessary to create a logical disk with the same capacity as an actual disk. Instead, the logical disk need only be large enough to contain the amount of data actually stored on the real disk, according to Glen Pleshorn, Datapoint's senior director of software product development.

Available later this month, the disk mirroring system is priced at $800 per server.

Datapoint also introduced the 9330 disk subsystem, which contains a 150M-byte disk drive and a 65M-byte tape cartridge drive. The company previously offered a 65M-byte disk drive and a 65M-byte tape cartridge subsystem. The drive and tape subsystem, which is currently shipping, is priced at $14,500. An extension feature that allows another 150M-byte drive to be attached costs $10,000.

In addition, Datapoint announced Arcnet Personal Network Services VS Cobol Workbench, an IBM Personal Computer- or compatible-based Cobol programming environment. Programs developed on a PC may be run on PCs, minicomputers or mainframes. The product is based on VS Cobol Workbench, developed by Micro Focus, Inc. in Palo Alto, Calif.

The Datapoint version is integrated with the firm's Arcnet personal network services, allowing the workbench program to access data throughout the network. Available late this month, the product will be priced at $4,000.

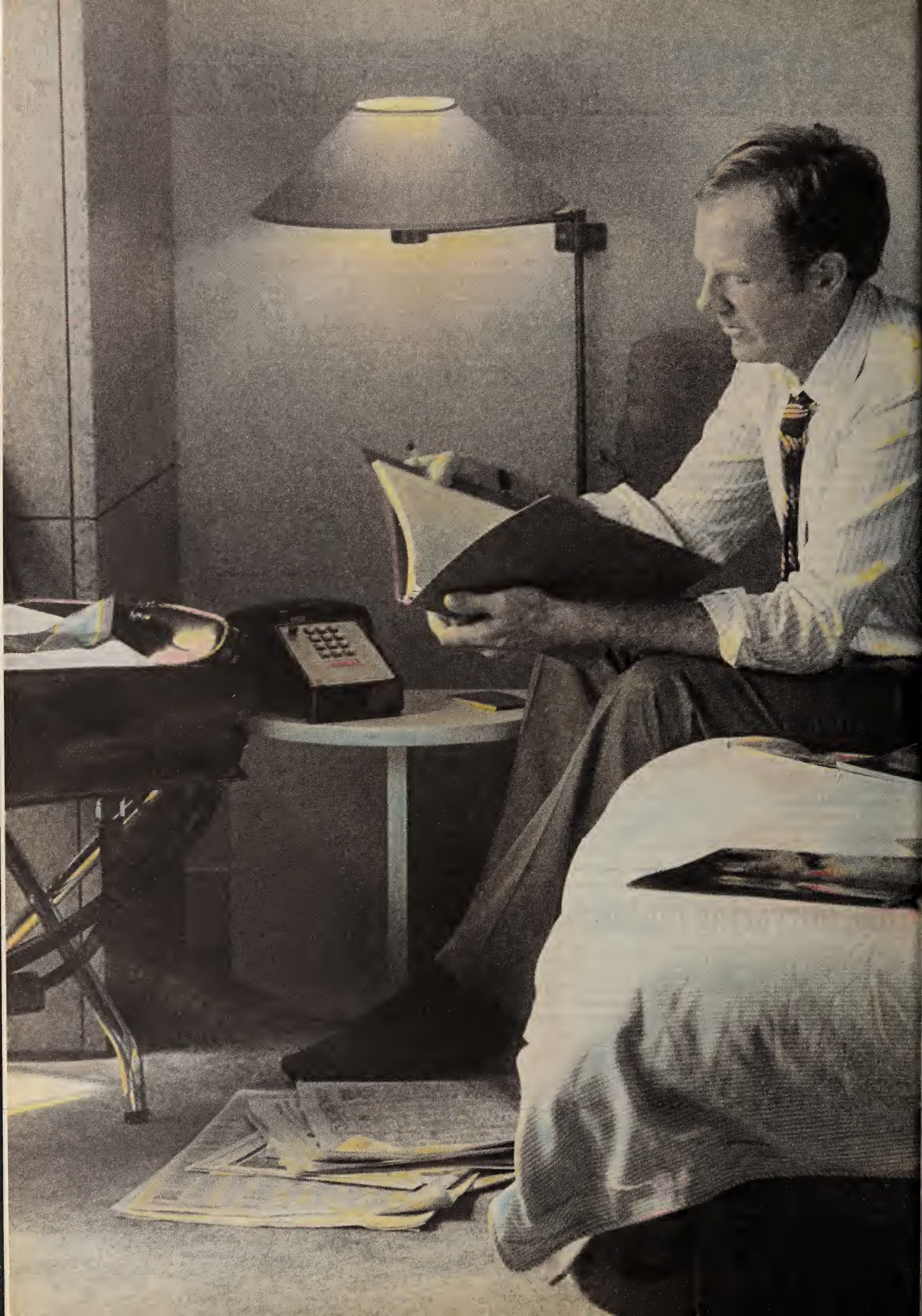
For MS-DOS machines, Datapoint announced Arcnet Personal Network Services Vista-Mail, which allows MS-DOS PCs to function as part of Datapoint's Vista-Mail E-mail system within an Arcnet local-area network. The product is currently shipping and costs $1,000 for four users, $2,000 for 10 users, $3,600 for 20 users, $6,000 for 40 users and $8,000 for 80 users.

PC software

Datapoint also announced Datapoll software, which allows a PC, even if unattended, to handle the distribution, collection and printing of files among central and remote sites. Datapoll is offered for a license fee of $495 for a master program and $295 for a slave program. Datapoll requires a synchronous communications adapter, priced at $295.

In addition, Datapoint announced high-performance versions of three system software utilities: Sort, Index and Reformat, which were rewritten for native-mode execution under RMS/XA. The utilities can offer up to 12 times the performance of earlier versions on the Datapoint 7900 processor, Pleshorn said. Under RMS2, performance may be improved up to three times, he said. The software is priced at $2,000 per server for new customers. It is free for current customers of Datapoint's support services.

Datapoint also rewrote its Databus interpreter in a version for RMS/XA. The new version, executing on Datapoint 7600 and 7900 processors, can provide up to four times the performance for string and arithmetic operations in some RMS/XA environments, Pleshorn said. It costs $1,500 per server and is free to Datapoint support services customers.



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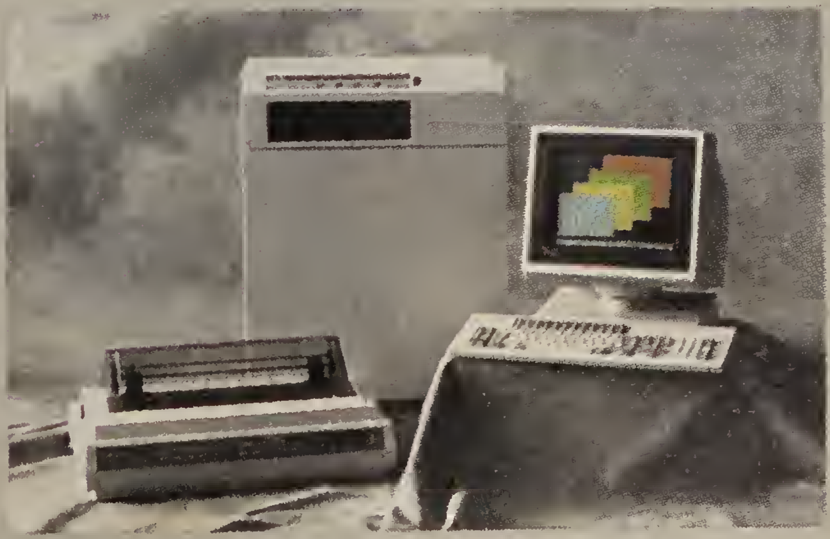

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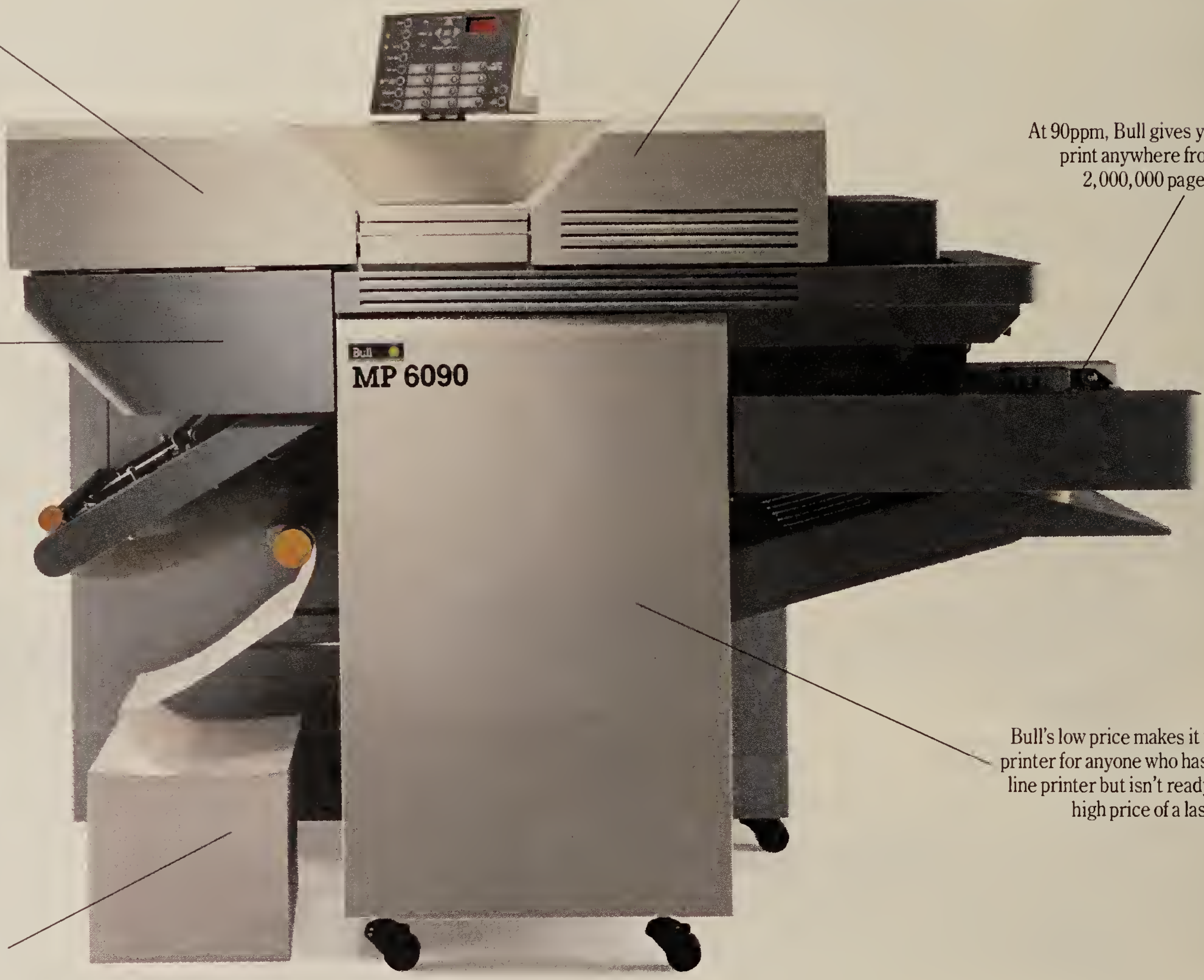

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High-volume printer out

LOS ANGELES — A 20 page/min IBM-compatible laser printer for businesses requiring up to 70,000 pages of printed documents per month has been released by Kanematsu-Gosho U.S.A., Inc. The printer is the first product from the company's information systems group.

The vendor, a subsidiary of a Japanese trading company, said the M5311 printer is aimed at high-volume applications, such as those in the financial, insurance, legal and medical service industries, and has a hardware life expectancy of more than two million pages.

It was designed to communicate directly with IBM systems through IBM 3270-based coaxial lines and IBM System/34, 36 and 38 twinaxial lines. It also uses industry-standard RS-232 and parallel interfaces.

It provides 300 dot/in. resolution, cut-sheet paper feeding, multiple paper-size accommodation, four resident fonts, a downloadable font library and portrait and landscape printing capabilities.

Options include a 2,000-sheet paper deck, a facedown dual-offset paper stacker and a duplex print module for two-sided printing.

The M5311 retails for $18,974.

HP expands OEM drive line

PALO ALTO, Calif. — Hewlett-Packard Co. recently took a second step in its effort to build an OEM disk drive business by doubling the data-transfer rate available on its HP 97530 drives.

The HP 97530D series is a family of 5¼-in. disk drives that includes an embedded small computer systems interface (SCSI) controller. The disk drives are available in capacities of 136M, 204M and 408M bytes.

The HP 97530S series, which was announced in July as HP's only OEM-oriented disk drive, has a synchronous data transfer rate of 2M byte/sec.; the HP 97530D series has a transfer rate of 4M byte/sec. HP officials said both sets of drives have an SCSI overhead of less than 1 msec and an average seek time of 17 msec.

HP officials claimed HP is ahead of schedule in achieving transfer rates in 5¼-in. drives that are normally associated with 8- and 14-in. drives.

Richard L. Raimondi, marketing manager for HP's Disk Memory Division, said HP originally had not expected 4M byte/sec. data-transfer rates until some time next year, but that the new models are available now.

The 408M-byte version of the HP 97530D costs $2,100.

Ibis ups drive's transfer rate

WESTLAKE VILLAGE, Calif. — Ibis Systems, Inc. has extended its disk drive product line with the addition of a 1G-byte drive featuring a 12M byte/sec. parallel transfer rate.

The Ibis 1012 was designed for systems such as minisupercomputers and image processors that need high-speed data transfers. The drive will operate on a VMEbus adapter and attains the peak 12M byte/sec. transfer rate through use of two 6M byte/sec. recording channels. The company said the sustained transfer rate is 10M byte/sec.

The Ibis 1012 includes 10 data read/write heads and one servo read-only head.

Available interfaces include the Ibis-1 OEM interface, the intelligent standard interface and a modified Storage Module Drive-Enhanced (SMD-E) interface. Ibis also recently introduced the Ibis1/VME host adapter. Ibis said the Ibis 1012 has dual-port and daisy chaining capabilities with each interface. An Ibis 1012 with the modified SMD-E interface costs $17,000 in OEM quantities.

Hitachi improves seek times, speed

SAN BRUNO, Calif. — Hitachi America, Ltd. last month introduced a Winchester disk drive designed to provide increased rotational speed and improved seek times by packaging 5¼-in. disk platters in an 8-in. form factor.

Hitachi claimed the DK711S provides an average latency of 6.15 msec and an average seek time of 12 msec with a rotation of 4,876 revolution/min.

The drive includes 13 5¼-in. disks rotated by a high-powered spindle motor using 22 data heads positioned by a rotary actuator, according to Hitachi. It features a 2.46M byte/sec. data transfer rate and provides 600M bytes of unformatted storage. The vendor claimed a mean time between failures of 30,000 hours. It comes with an enhanced storage module drive interface and has an optional built-in dual port.

It costs $5,500 in OEM quantities. Samples reportedly will be available during the first quarter of next year.

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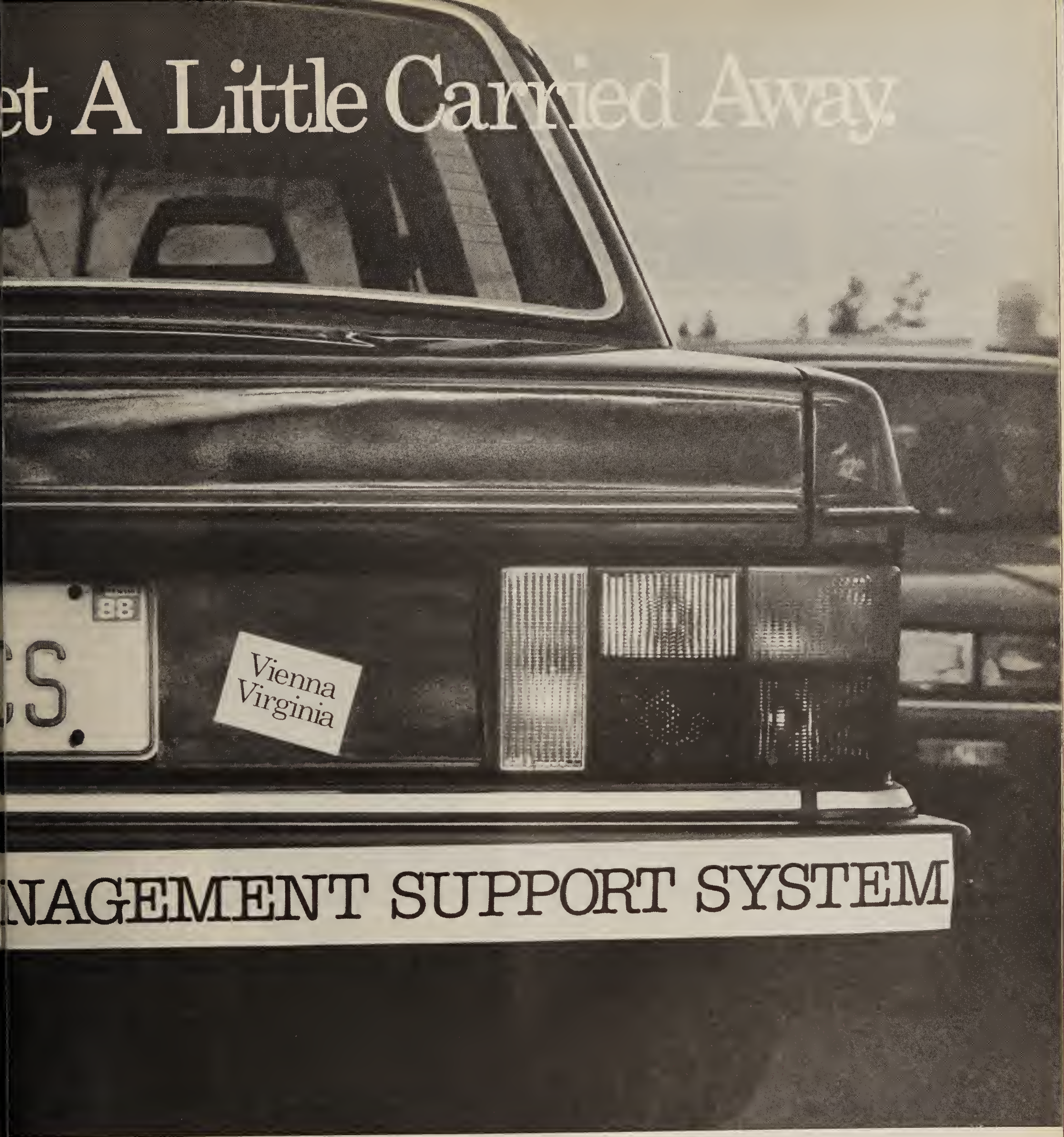

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Connolly

FROM PAGE 67

bered that relatively few users, even in MIS shops running several 3090s, jump up to buy a new system principally because it has leading-edge features. Those features take years to fully implement.

Conversations with MIS managers indicate that even in those shops that use expanded storage, it is being used for special purposes in a semiexperimental mode.

Some managers who say they want faster channel speeds admit they are less interested in speeding the movement of bits than in cutting back the number of cables that are snaking through their data centers.

In addition, the average shop is unlikely to buy a 3090 now to support a version of MVS/XA that may not be available until 1989, at least if one measures the leading edge of the operating system market by the track record of MVS/XA. That was announced more than four years ago and only recently reached the 50% market penetration level.

Of course, there are users who want every new feature that IBM or any of their other key vendors offers them.

But if managers are not buying 3090s, it is apparently because they have either enough processing power already or used 3080s provide a cost-effective alternative.

In either case, leading-edge features that take two to four years to fully use will not convince those people to pay several million dollars for a 3090 machine.

Rather, those users can look at the features as they are announced and use them to figure out IBM's direction and, as a result, set their own courses.

Connolly is *Computerworld's* senior editor, systems & peripherals.

Sun 4

FROM PAGE 67

burg Co. "With Motorola, you're topping out at about 10 MIPS. But with Sparc, you push it to 20 or 30 MIPS.

"They've made the right decision in going to Sparc," Wu said. "The Sun 4 may not be a knockout blow, but it's a move in the right direction."

Won't displace the VAX

Industry watchers said the Sun 4 will appeal largely to the company's installed base and is not likely to replace higher end systems, such as Digital Equipment Corp.'s VAX family. "No one's going to hook terminals to a Sun 4," Hambrecht & Quist's Herwick said. "It's not going to displace the VAX in a general-computing environment."

Some said Sun's installed base may drag its feet before switching to the Sun 4 because of the change in microprocessors.

"There's a big question mark in how the installed base will react," said Omri Serlin, president of Itom International Co.

Sun may be hedging its bets with hints to customers that it will also announce a Motorola 68030-based line, Serlin said. "They're trying to tell those that don't want to go to the Sun 4 that they won't be abandoned," he said.

Zitel

FROM PAGE 67

lutions per minute, an average latency of 8.3 msec, an average seek time of 15 msec and an average access time of 23.3 msec, according to Zitel.

Nancy Weintraub, Zitel product marketing manager, claimed the eight-drive Kwikcache KC4000 provides 920M bytes of storage per square foot, compared with 482M bytes for an eight-spindle 9494-24 and 233M bytes for the MD8-4.

Kwikcache can support two, four, six or eight drives. It connects to medium-size Unisys systems through a standard Unisys interlaced Data Link Processor (DLP) or a sequential DLP. On large Unisys systems, the host adapter connects to a sequential DLP.

Prices start at $53,400 for a two-drive system.

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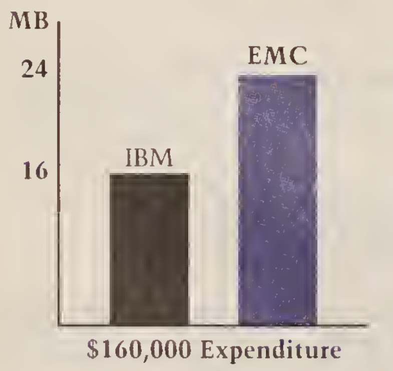

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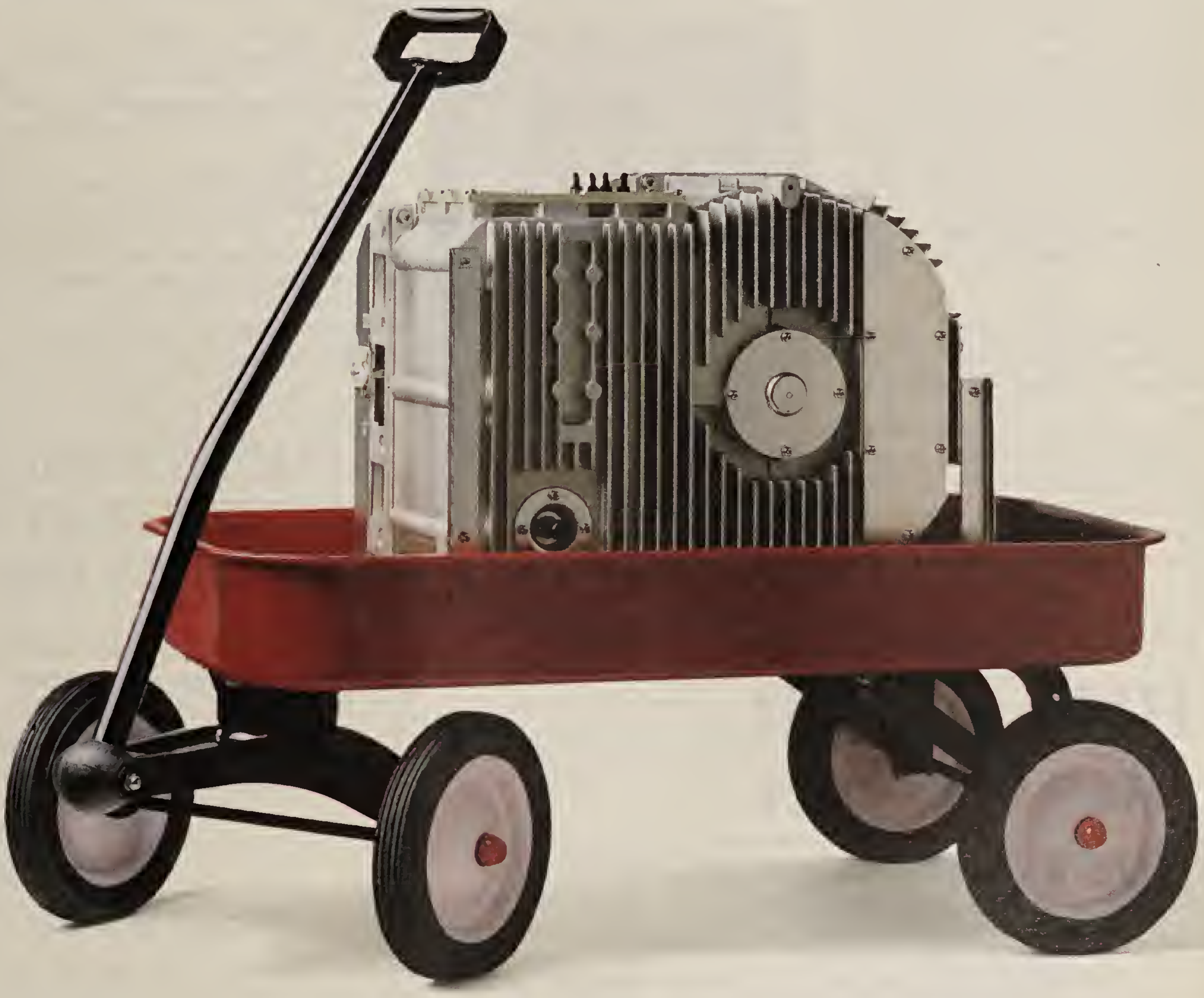

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NEW PRODUCTS

Processors

IBM has announced expanded support for ASCII and channel-attached devices for its **9370 Information System.**

Additional device support is available via the integrated System/370 Block Multiplexer Channel for IBM 3410, 3411, 3505, 3525, 3211, 3811 and 3540 devices.

The 9370 ASCII Subsystem Controller offers more terminal-attachment capability. The ASCII Subsystem Controller is now supported by the PC/Host File Transfer and Terminal Emulator Program for the attachment of IBM Personal Computers and Personal System/2s.

Also, IBM said, VM support is being extended to the 3820 printers when attached to the 370 Block Multiplexer Channel for the 9373 Model 20.

IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573. 914-934-4000.

A 32-bit Motorola, Inc. 68020-based general-purpose processor board has been announced by **Plessey Microsystems, Inc.**

The board, called the **PME 68-25**, features up to 4M bytes of dual-ported dynamic random-access memory, flexible local memory, multiprocessing support including mailboxes, off-board reset , local memory addressing and access control and a VMEbus interface. It is available with processor speeds up to 25 MHz.

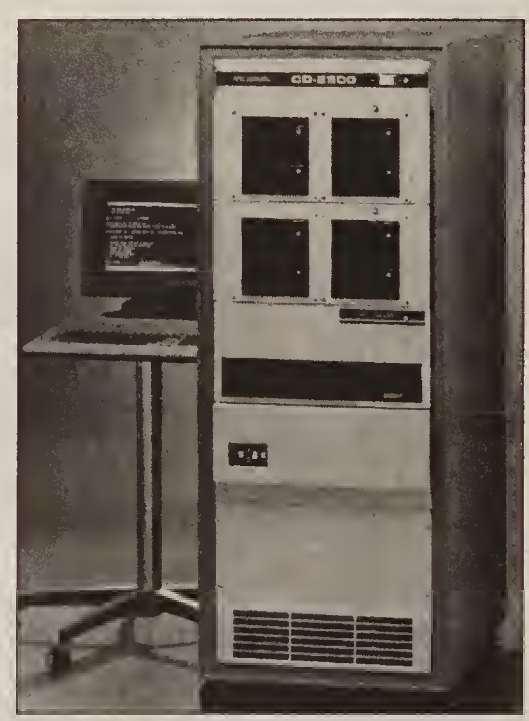
Other features include two serial ports and 24 parallel I/O lines as well as the vendor's PEX interface, which allows additional I/O functions using plug-in modules.

The PME 68-25 costs $1,935.

Plessey, One Blue Hill Plaza, Pearl River, N.Y. 10965. 914-735-4661.

Data storage

Applied Data Communications, Inc. has expanded the number of standards and formats supported by its **CD-2500** tape duplication system.


The CD-2500 *system*

CD-2500 now supports Digital Equipment Corp.'s TK50 ½-in. tape cartridge drive as well as the quarter-inch compatibility (QIC)-40, the QIC-100, the QIC-106 and the QIC-120. Capacities supported by the CD-2500 in ¼-in. cartridges range from 20M bytes for a four-track to 125M bytes for a 15-track cartridge. For ½-in. tape drives, the CD-2500 can now handle the 800/1,600/3.2K/6.25K bit/in. formats.

A small computer systems interface host adapter has also been added to the system.

The CD-2500 costs $39,950, including a monitor and four QIC-11 or QIC-24 drives.

Applied Data Communications, 14272 Chambers Road, Tustin, Calif. 92680. 714-731-9000.

Terminals

A portable data terminal called the **MSI RDT** has been announced by **MSI Data Corp.**

The hand-held on-site data entry system was designed for all-weather or wash-down environments. It measures 10 by 4.6 by 3½ in. and weighs 29 oz. Two keyboard operations are featured, including a standard 51-key conductive rubber design and a 36-key version with application-specific key caps.

Other features include a 4-line, 20-character LCD and an interface memory management unit.

The MSI RDT is priced at $2,315.

MSI Data, 340 Fischer Ave., Costa Mesa, Calif. 92626. 714-549-6000.

Printers/Plotters

Western Graphtec, Inc. and **Quality Tempest Products Corp.** have announced a Tempest version of the **MP3200** flatbed pen plotter.

The Tempest model is housed in a shielded enclosure, and all user-control switches are on the exterior. It reportedly can interface with any type of host via a dual RS-232C/Centronics Data Computer Corp. interface. Features include two built-in switch-selectable command sets and a 5K-byte memory.

The MP3200 Tempest model is priced at $3,995.

Western Graphtec, 12 Chrysler St., Irvine, Calif. 92718. 714-770-6010.

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BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. **DOS** and **OS.**
BIM-FMAP — CICS BMS on-line map generation and maintenance. **DOS** and **OS.** NEW
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The project postmortem

Other branches of engineering spend time and money examining their mistakes

BY JOHN BODDIE

We continue to produce too many failures — systems that do not perform well in their intended roles. We talk about software engineering but reject one of the most basic engineering practices: identifying and learning from our mistakes. Errors made while building one system appear in the next one. What we need to remember is the attention given to failures in the more established branches of engineering.

As engineer Henry Petroski writes in *To Engineer is Human: The Role of Failure in Successful Design* (St. Martin's Press, N.Y., 1985), "I believe that the concept of failure is central to understanding engineering, for engineering design has as its first and foremost objective the obviation of failure.

"Thus the colossal disasters that do occur are ultimately failures of design, but the lessons learned from those disasters can do more to advance engineering knowledge than all the successful machines and structures in the world."

In software projects, as in bridge building, a successful effort can do little more than affirm that the methods used were sufficient for the task. By the same token, failed projects need more than explanation or rationalization if they are to teach any lessons. Projects that fail need an organized effort to uncover what really caused the failure. What these projects need is a postmortem.

Accountable for actions

The payoff of a good postmortem is a smarter organization. Once team members have gone through an analysis of how and why a project failed, they can apply this knowledge to subsequent projects. Team members include programming supervisors, project managers, MIS administrators and, occasionally, general managers.

The postmortem team must recognize the degree of control exercised at each level of project management and be prepared to offer criticism and suggestions for each of them.

The greatest benefits can be expected at the project management level. This is the level at which the failure will be felt most acutely and at which point the learning process is the most effective. In going through the postmortem, the project management team will review its actions — and lack of action — and judge the consequences of each.

The postmortem experience is much like a losing football team watching a game film. It's not comfortable, but if the team pays attention to its mistakes, it can perform better the next time it plays.

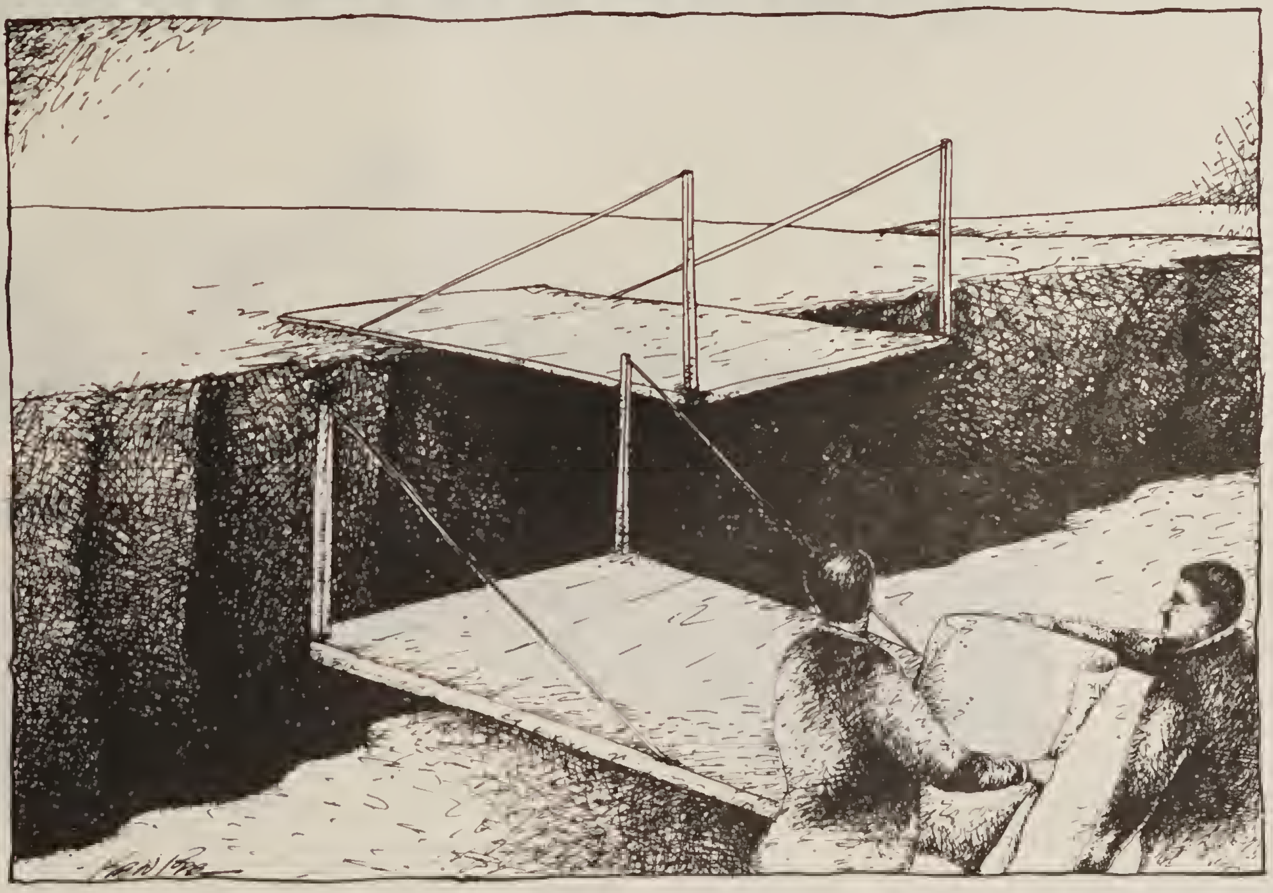
Direct benefits exist for those at lower levels of the project hierarchy as well. For programmers, who often have a poor view of the overall situation, the postmortem can fill in the blanks and let them see what really happened. In some cases, this helps erase doubts about ability.

Bob Fanelli, now with Yourdon, Inc. in New York, recalls a project he worked on to control power distribution for a New Jersey communications center. A new and sophisticated system had been developed, but it was difficult to understand. Normal actions within the new system looked a lot like error recovery from earlier systems.

"Marketing had beaten us up pretty badly. They got a consultant in to look at the system. We didn't look forward to this because we thought we'd really messed up," Fanelli says. "But the consultant looked at what we'd done and the time it took us to do it and told marketing that he'd never seen that amount of high-quality work produced in such a short time. That made us feel a lot better. Marketing began to show us a little more respect, too."

One bad apple

It is a rare project indeed in which absolutely everyone messes up. An enterprise cannot afford to assume its people are losers just because they worked on a project that failed. Recognition for work well done in an



KEVIN POPE

- To engineer is human
- Postmortem payoff: A smarter organization
- Worth the embarrassment

Boddie is president of Unusual Software, a software consulting group in Newark, Del. He has designed and built software for everything from state lotteries to gasoline blenders. He is the author of *Crunch Mode: Building Effective Systems on a Tight Schedule* (Prentice-Hall, Inc., Englewood Cliffs, N.J., 1987).

effort that was unsuccessful overall will reassure good performers. However, it will not be possible to host a postmortem that leaves everyone feeling good. After all, the project failed.

THE POSTMORTEM team must recognize the degree of control exercised at each level of project management and be prepared to offer criticism and suggestions for each of them.

The most obvious consequence of not performing a postmortem is that the actions that led to failure may be repeated. Without analysis to identify specific problem areas, those areas will not receive special attention on the next project.

Ralph Baker, a senior analyst in the advertising industry, managed the development of a data collection system that was finally removed after many operator complaints. Baker felt the user had sabotaged the project by canceling several of the review meetings. He did not take the time to understand that the reason the user canceled was because the reviewers, including some operators who would eventually use the system, were simply too busy to take days off to listen to presentations.

In his next project, Baker allowed extra time to ensure that review meetings could be held. He scheduled enough of them so it wouldn't matter if the user missed a couple. His new user accommodated Baker by sending a coordinator but not anyone who would be using the system on a daily basis. Again, the user interface proved to be a major problem, and extensive changes were required.

Fortunately, the user in Baker's second project insisted on finding out why the user interface was such a problem. Only then was the isolation of the development team from the end users identified as a key issue.

Postmortems are rare

Why aren't postmortems done more often? Why is it that there always seems to be a rush to put the past to rest and go on to something new?

An obvious reason is the reluctance of an enterprise to allocate additional money to a project that is seen as a failure. This reluctance can take several forms, from outright refusal to requests that the benefits of the postmortem be quantified before it is approved. Unless the enterprise understands that a study of past mistakes is the best safeguard against future ones, this monetary argument is likely to be insurmountable.

In addition to the financial problem, there is a natural human desire to put past problems behind you. People who have lived through a project failure often have a sense of relief when it is finally killed. There won't be any more 60-day extensions to try to put out the latest fire or deliver software that is going to take 120 days to develop.

Gary Ow, president of GO Associates in San Francisco, has performed technical evaluations for several of the country's largest companies. He says that personal reasons run strong for not wanting a postmortem examination of a project. "People don't want to feel embarrassed," Ow says. "They can feel like they are protecting themselves by avoiding an end-of-project review on a bad project."

Who is the pathologist?

A postmortem needs a pathologist — someone to examine the details of the project and announce conclusions as to the causes of failure.

Should the project pathologist be someone already employed by the firm? It depends. In some companies, internal software audit groups review projects during the development cycle and at their conclusion. The strongest argument in favor of finding the pathologist inside the enterprise is that he will already know about the project, its goals and the environment in which it was developed.

Occasionally, the postmortem task is assigned to the people who worked on the project. However, it is hard to maintain the degree of detachment necessary in this situation. Just as it is difficult for a programmer to test his own code, it is difficult for a project manager to objectively analyze his project. When internal postmortems work, it is usually because they deal with a system that is viewed as a success but that needs a few refinements.

It often makes the most sense to bring in a project pathologist from the outside. But how do you find one?

In Ow's opinion, "The most important thing to look for is an expert in the application area, someone who also has technical skills." If such a person is not available, you should look for someone with a record of producing successful systems in a variety of application environments.

Second, if your pathologist dives into a project's paperwork and immerses himself in a paper chase, then find another one. It is tempting to look for answers among the schedules, progress reports, memos, program listings, charts, design drawings and the many other forms of processed cellulose related to even modest-size projects.

However, the good pathologist should let interviews with project members be his guide as to which papers are important.

With understanding

The postmortem is not a witch hunt: It is an investment in professional development. It makes no sense to go into it looking for every problem that occurred. Problems arise in successful projects, too.

In *The Secrets of Consulting* (Dorset House Publishing, N.Y., 1985), Gerald Weinberg suggests these three rules for the project pathologist to keep in mind if the postmortem is to

Theirs takes hours.

Installing and configuring a 3270 or RJE remote host connection for BSC or SNA NETBIOS LANs? With the competition, it'll seem to take forever. While RabbitGATE™ takes just a few minutes. It's so easy that most people don't ever open the user guide.

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Benefit from your mistakes

The lessons learned from a failed project will help you succeed in future projects — if you keep them firmly in mind.

Prescriptions for managers:

- If you dropped a quarter of a million dollars letting them do it wrong, think how much it's worth to help them get it right.
- If you want to hold a postmortem to identify the S.O.B. who caused this disaster, there's a good chance that you are that S.O.B.
- It sometimes pays to do a postmortem on a successful project. It can help you figure out if you're good or just lucky.
- The purpose of a postmortem isn't to provide all the answers. It's to get your people thinking about the right questions. That's the only way they'll get better.
- Beware the pathologist who tries to sell you his services in building your next system. His postmortem is likely to be a sales pitch in disguise.

For the managed:

- Don't worry that you are the one who made it fail. In order for one individual to make a project fail, that person has to be pretty far up the ladder.
- Never for a moment think that you are incapable of making the same mistakes that those above you may have made.
- If you had been your own manager, could you have done a better job? Yes? Then think about this — you managed more of your time than anyone else did.

JOHN BODDIE

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be effective:

- Things are the way they are because they got that way.
- Study for understanding, not for criticism.
- Look for what you like in the current situation and comment on it.

The pathologist must first understand what the system was supposed to do. Following this, he must identify, one, what the system does correctly; two, what it was supposed to do but does not; and, three, what it was not supposed to do but does anyway. It is not unusual, especially when a long development cycle has evolved, to find a system whose goals changed somewhere in the cycle. The pathologist must look carefully to see if the changes are refinements based on the original goals or departures leading to a much different system.

Remember that the end user's perception of the system is the most important judgment of its quality. If the system does not live up to the end user's expectations, it will be seen as a failure.

It sometimes happens that the goal of the system is understood differently by the end user and the developer. This manifests itself in two ways: Either the failed system is much more sophisticated than the end user wanted or much cruder.

I recently looked at an inventory management system that was canceled because of late delivery. The programming team had put in a lot of work, but the system contained so many features that there was not time to do them all. Many of these features were mentioned in only the vaguest of terms in the original specification. The marketing department had, on its own, added some features they thought would help to sell systems in the future and presented all of these to the developers as mandatory.

Sometimes a project starts with a stated goal that is not regarded as realistic by those who must build the system. The pathologist must recognize this condition and call attention to the fact that an earlier expression of doubt about the goals could have saved considerable time, money and stress for all involved.

Once the goals of the system are understood, the pathologist must examine the design process. Very large project failures start as design failures. If the analysis and design activities are carried out correctly, the signs of impending difficulty should be clear for all to see.

When the project pathologist looks at a system in which some functions work very smoothly and others look more like kludges, he should try to determine if there was a change in design or if the system was adapted from another one. In both cases, rough edges in the operator interface or processing organization can usually be spotted. The presence of a number of "bridge" files can also indicate a system whose design changed during the implementation process.

If the pathologist cannot read and understand the original specifications, he needs to make sure the project implementers did not have the same problem. Open friction between designers and implementers is another warning sign that the system lost something in translation.

Great expectations

Failure to develop realistic schedules based on design is also a common problem. In all too many systems, the expected time of delivery is based on preliminary estimates or set by executive order. The pathologist should check carefully to see if subsequent estimates were based on the actual design (if they were made at all) and whether these estimates were eventually reflected in schedules given to the user.

Projects in which estimates are changed by executive pronouncement often wind up as

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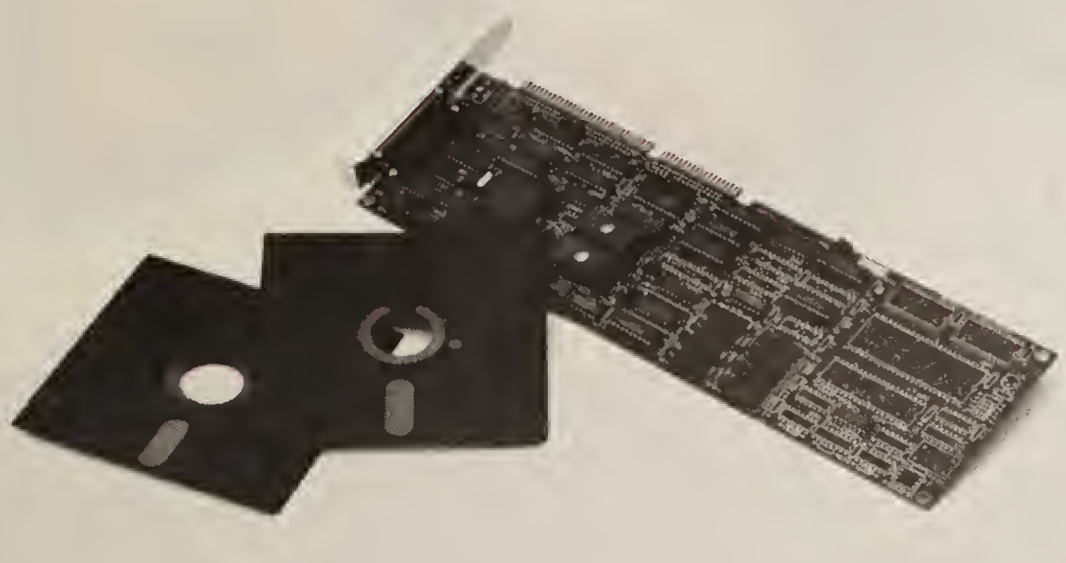

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failures. While a slippage may have been agreed on by the developers and users to add an enhancement, for example, numerous slippages in delivery dates or milestones are telltale signs of a project that has trouble with its estimates.

Look to the plan

The most important trail followed by the pathologist is the project plan. If the project plan has been carefully maintained, the underlying causes of failure can always be noticed in it. Furthermore, since the project plan tells the story of the project, it forms a useful backbone for the pathologist's final report.

Systems that failed because of not being ready on time must have deviated from the plan. The pathologist needs to know if the causes for deviation were analyzed at the time they happened. It may be that a deviation was noticed but that its impact was never anticipated.

The plan itself may be a source of problems. If deliverable items were not clearly identified or if there were no deliverables until late in the project cycle, it may have been difficult to determine that the project was in trouble until it was too late to correct it.

If the pathologist finds changes in the project plan, he needs to know what caused them. Earlier assumptions may be invalidated. A change in tax laws may force a change in a portfolio management system. Perhaps initial tests showed that the selected hardware could not handle the sampling rates required in a process control system. The changes in the project plan showing a new front-end processor activity will be a direct consequence of these test results.

Early warning system

Very few projects fail suddenly. A project postmortem alerts team members to signs of trouble so those signs can be recognized and dealt with on the next project before trouble becomes unmanageable.

The most obvious early warning is the missed milestone event. Milestone events should be tied to demonstrable features of the system. "Coding 50% completed" is not a very good milestone. "System accepts new customer application" is much better.

A single missed milestone will not spell disaster for a project, unless the project is on an extremely tight schedule. However, a pattern of missed milestones that does not show a continual reduction in the amount by which they are missed is a certain sign of eventual doom.

Just like missed milestones, continual requests for additional resources are a sign that the project had a troubled journey. This is particularly true if the requests are for new and different resources each time. Such a situation indicates problems in the design and analysis effort.

If the project has been hurt by an unusually high degree of staff turnover during development, the pathologist must try to determine the cause of the turnover. It is a good idea in this case to contact some of the people who left to see if there is a common reason for departure.

Death during testing

A lot of projects look like they are proceeding well right up to the point at which system testing starts. In performing a postmortem on a project that died during testing, the pathologist must find out how test plans were set up and how errors uncovered during testing were handled. Particular attention must be paid to the coordination between test planning and software design.

> IF YOUR organization already does walkthroughs and design reviews, it has the postmortem habit.

If the project pathologist is examining a system whose problems come as a surprise, he should pay careful attention to the information flow, from the project team on up the ladder of responsibility. Many times, disturbing information about the project will be suppressed in the hope that problems can be cleared up and the project returned to schedule. If the pathologist finds this is the case, he must point it out as a serious problem.

This is not a very pleasant task. A postmortem that uncovers evidence that progress reports have been incomplete or misleading will almost always result in hardship for the report writers. And there is no point in putting this information in a confidential addendum to the postmortem report. The people who worked on the project will already know about the shading. If they do not see it mentioned in the postmortem report, they will regard the report as a political document, and it will lose its ability to teach.

The project pathologist should also take a look at the way the development group was structured. The problems caused by an inappropriate project group structure can pass unnoticed during the project. It is only at the end of the project that the effect of too many meetings and too many memorandums becomes clear.

Technicalities

The postmortem cannot be a one-dimensional activity. It needs to look at technical as well as management aspects of the failed system. The pathologist must grasp the essential features of the system design and understand how the decisions that led to it were made. He must also pass judgment on its suitability for

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meeting the goals of the system.

On the other hand, the postmortem must not get bogged down in a mass of technical detail. It is enough to say, for example, that the design required a large number of intermediate files and that the resulting number of file accesses caused poor system response.

The pathologist may recommend that a data base expert's services be used on the next project, but the postmortem is not the place to try to teach the fine points of system design or come up with an alternative to the one tried. Also, technical approaches that look bad in retrospect should not be criticized out of hand. There may have been good reasons for adopting them at the time. Was there enough time to consider alternative approaches? Were the developers required to use a specific existing hardware or software package?

> THE POSTMORTEM is not the place to try to teach the fine points of system design or come up with an alternative to the one tried.

Sometimes the pathologist will find that the developers were not aware of available tools or techniques that might have helped them. In the postmortem report, the pathologist should not be afraid to recommend additional training for existing staff or the hiring of an expert.

When interviewing project team members, the question to ask is, "What happened?" The learning associated with a successful postmortem does not come from a study of the final report. It comes in discussing what went wrong and what went right with the people who were there when it happened.

Although querying team members collectively ensures fewer gaps in the narrative, the pathologist should not work with a group that contains both subordinates and superiors. Open discussion will be stifled. He may be able to gather information more quickly and completely if he can get together with a group consisting only of programmers or team leaders. It is also instructive to see which points are given specific emphasis by the different groups.

On the other hand, individuals who had management responsibility in the project must be interviewed privately. The observations they make about the course of the project will be about other individuals rather than about technical issues.

It is not unusual to find that the people who could contribute to the postmortem are not readily available to discuss the project. In some of these cases, they may be working for another firm. There is disagreement among experienced project reviewers as to whether these people should be contacted. Ow says there may be excessive bias in their opinions.

I believe these people represent a valuable point of view because, while they are familiar with the project, they are also now removed from it.

Writing the report

To be effective, the postmortem report must not be too detailed or too long. If it is, it will not be studied. Most good reports run less than 50 pages. One of the best I've seen took fewer than 20.

The report must be written so that individuals outside the immediate project development group can benefit from it. To this end, leave personalities out of it. The report must concentrate on describing the development effort as a process, pointing out those areas of the process that caused problems. Individuals should not be named in the report unless they turned in exceptional performances.

The postmortem report should also avoid speculation on what might have happened if things had been done differently. Problems that contributed significantly to the failure of the system should be pointed out, followed by suggestions as to how these problems can be controlled in the future. Parts of the project that turned out well should be recognized as such. If new development techniques or tools were used, their effect should be evaluated.

The report should be made available to everyone who worked on the project and to teams working on projects of similar scale. The postmortem report cannot help people do better if it is locked away in a vice-president's file drawer.

Always look back

If your organization already does walkthroughs and design reviews, it has the postmortem habit. Many firms employ software techniques such as structured analysis and the Jackson methodology to reduce errors during the analysis and design of software systems.

However, adoption of an analysis and design technique is not, in itself, sufficient to prevent failure. You need to perform postmortems. You must be willing to invest the time and energy into looking at what was produced and how it was produced when the end result does not turn out as you expect.

The concept of software engineering promises significant advances in our ability to produce software with better functionality and fewer errors at lower cost. In order to make this concept a reality, those of us who build software need to treat failures the way other engineers do.

Failures need to be seen as opportunities to learn something rather than as embarrassing moments to be quickly forgotten. ●

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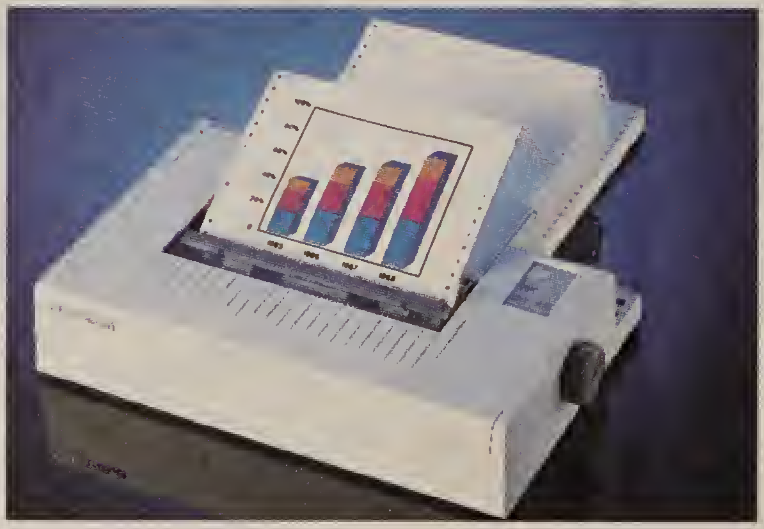

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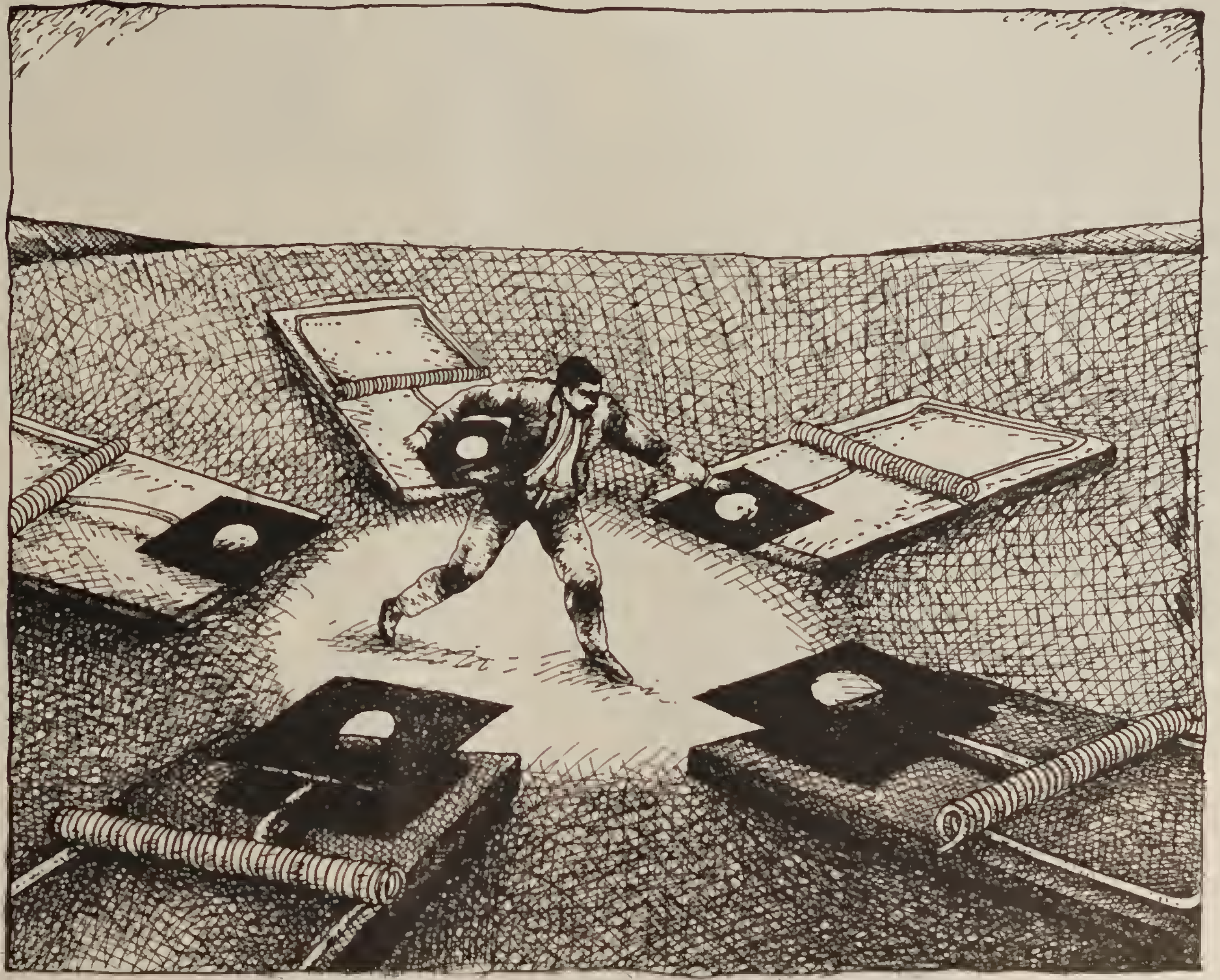
20M/10/87

Testing for usability can head off disaster

Not 'Does it perform correctly?' but 'Can they use it?'

BY BOB STAHL

Under mild protest, a busy project manager is waylaid by a new employee and ushered into a conference room. Some time later, the manager emerges, ashen-faced. He has just seen a condensed videotape of users struggling with the system he planned to release in a month. Subsequently, he halts the project, makes a number of changes and turns the release from a potential disaster into a success.



KEVIN POPE

The tape was made by the usability lab, a new service at this major corporation. "Sometimes you have to get their attention," says the head of the lab, who explains that his company made a conscious decision to not require usability testing of new systems — to avoid this requirement's becoming a rubber stamp for developers.

Instead, the usability lab is strictly a resource for project managers and developers. However, "once they see what usability testing can do for them, we're swamped," the lab's supervisor says.

Testing interaction

More and more companies are deciding that usability testing for interactive systems development or selection is as important as testing for bugs. In traditional testing, developers examine the software in isolation. Does it perform business functions correctly? Does it malfunction when fed certain combinations of data?

In usability testing, on the other hand, we test the interaction of the software with people. Unless that interaction works well, the chances of the software's being accepted and used productively are poor. Traditional testing primarily tests programming. Usability testing tests design.

Another important difference is the nature of the testing process. In traditional isolation testing, we can hand a malfunctioning system back over the cubicle wall to the programmers and say, "It blows up when it tries to read a file with more than 32,768 records. Please fix it." A programmer can look at the code, get a dump or use a debugger and fix it.

In usability testing, it is not enough to say to the programmers, "People seem to be confused about how to save their files." The testers have to diagnose the problem and suggest a fix.

Valid, useful data

The goal of usability testing is to get valid, useful data about the problems people have with the software and to diagnose the cause. The word "valid" is important because it's easy to get data that isn't valid. For example, our subjects may not accurately represent the end users; we may unwittingly intimidate the subjects or coach them.

The word "useful" is equally important, since not all hard data is valuable. For example, an error count for a subject trying to perform a specific task can be misleading. Some subjects, especially experienced ones, may be quite comfortable exploring the software by trial and error. They often generate high error counts that do not reflect serious trouble. Other subjects, particularly those who are timid, may be severely confused yet generate lower error counts because of their reluctance to interact with the computer.

Finally, diagnosis is necessary. This requires getting the right kind of feedback from the end user and knowing how to classify the various kinds of

……

- **Usability labs sprouting up all over**
- **Videotapes of end users learning**
- **Objective *and* subjective testing**

Stahl is president of The Interface Design Group in Oakland, Calif., which provides training and consulting on software usability design and testing.

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inappropriate user actions (see story page 90).

The success of any interactive system from a usability standpoint depends on the following measurable variables:

- Learning time.
- Task performance time.
- Error rates.
- Error recovery time.
- End-user satisfaction.

At the requirements definition stage, usability acceptance test criteria are negotiated and agreed on. This gives the designers and testers measurable goals to work with and provides the project sponsors with realistic expectations for the final product.

> SUBJECTS must spend a good deal of time using the system before we're actually measuring ease of use rather than ease of learning.

The functional specification should include the external design of the system. It specifies not only the appearance of the end-user interface (screen design, assignment of function keys) but also navigation and how the system will behave for user inputs in all possible situations. For example, what happens if the end user presses "ESC" during a data base update?

Dialogue mapping using state transition diagrams, a useful technique, permits designers to spot inconsistencies, predict problem areas and protect the design against unexpected actions by end users [CW, Sept. 15, 1986].

Dialogue mapping also provides documentation of the interface, both in diagram and table form. Most important for testing, this technique produces a first-pass set of test criteria that the designers can apply themselves.

Design feedback

During the "systems build," or detailed design and coding, phase, rapid prototyping provides early feedback on design choices. However, there are three things to always be wary of:

First, since a prototype lacks much of the application code, many problems cannot be detected. We can find out that end users do not understand the difference between the two menu choices Save and File. But we will not see what happens when a user tries to save a file when the data base is locked for update by another user. While it will not come up with most prototypes, this situation requires careful handling when the production system comes into use.

Second, we cannot predict productivity with a prototype, since users cannot use it for long periods or do real work with it.

Third, end users are not designers. It is unrealistic and unfair to expect them to understand all the design options or to predict usability from a prototype. Many projects have failed because of the designers' belief that "We're in pretty good shape on usability because we ran several prototypes by the users, and they didn't have any problems."

End-user input

From here on we'll assume that the system has been tested using dialogue mapping to be sure that it performs according to the external design specifications.

The remaining questions are based on whether end users will have problems with parts of it, whether they will find it productive and whether they will like it. To determine these things, we'll need test subjects and procedures.

Who should the subjects be? They should be real end users, not user representatives. Also, standard wisdom dictates that you never use developers to test their own systems.

There is a good case to be made, however, for letting the developers test the system first, before using "real" subjects. Many developers have never used the whole system or have never used it to perform real work. Sometimes this procedure can be very enlightening.

Jim Boyle, manager of software human factors at IBM's Santa Teresa, Calif., facility,

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relates one such instance.

"We had the developers try their own system," Boyle recalls. "They'd get an error message and say, 'Good Lord, I wrote that error message, but I never expected it to come out in this context. If I had, I would certainly have worded it differently.' Finally, they said, 'Look, give us four days to work on this before you try it on real users, OK?' We did, and they achieved one of the greatest improvements in usability we'd ever measured."

When real end users have been selected, we have to make it very clear that it is the system being tested, not the person. Subjects should be told, "We know we haven't gotten this right yet, and we expect that the system will cause many errors. We'd like you to help us find the problem areas so that we can fix them."

The next step is to have end users perform typical tasks on the system and document the results.

Getting ready

Test equipment can range anywhere from a simple clipboard and stopwatch to $80,000 testing rooms replete with one-way glass and recording and videotaping equipment. The size of your budget does not matter, as long as you can observe and evaluate the subject and his procedures.

The end user's performance on the system is determined by a subtle mixture of the system design itself and the effectiveness of the training and the manual. Ease of learning, which is critically important for public-access systems such as automated teller machines, means the system should require little or no instruction for use. (IBM defines its goal for public-access systems as being ready for the user to "Walk up and use.")

However, the learning curve quickly escalates when we measure ease of use and productivity for systems like a companywide electronic mail service.

Testers need to probe carefully to determine the true cause of problems. As a rule of thumb, beware of the temptation to assign fault to the manual unless it is obviously garbled. If a manual is obtuse, it is usually because the software features it describes are too complex or are implemented strangely.

> IF PEOPLE don't like an interactive system, it will eventually fail. They'll complain about it, avoid using it and sabotage it until the beast finally dies.

Another complication in testing is that subjects must spend a good deal of time using the system before we're actually measuring ease of use rather than ease of learning.

It may be more practical to work with one piece of the system at a time. For example, with a financial system we may work with just the accounts receivable portion, then move to accounts payable and so on.

Get good exercise

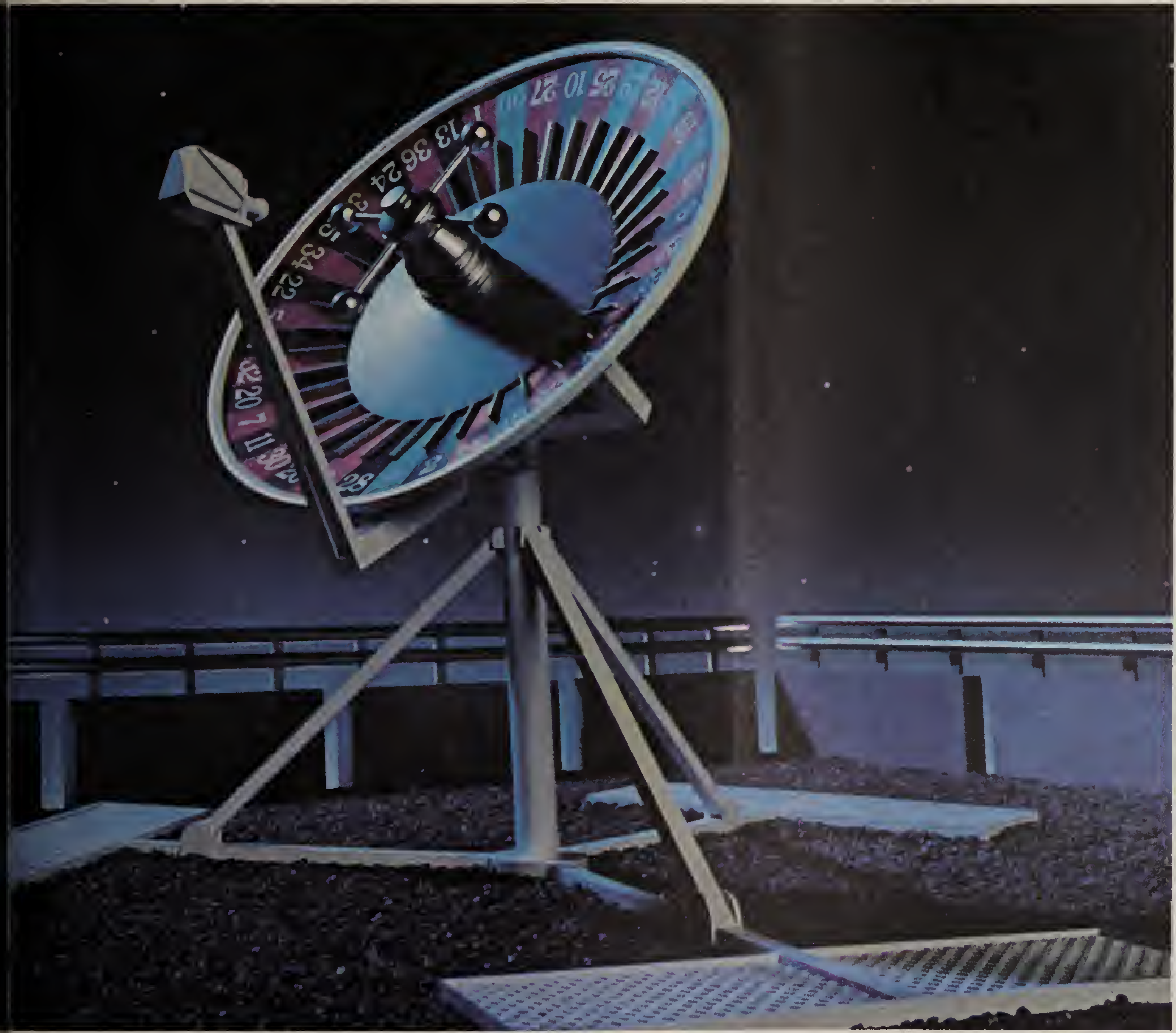
Draw up a script of tasks for the subject to try to perform. The script should exercise the important functions several times. The task requests may be written, or they may appear on an auxiliary CRT placed next to the test terminal.

If the subject has no real problems, it is straightforward procedure to measure the learning and performance times and later to get feedback on end-user satisfaction.

However, when an error occurs, we have to understand what is going on in the user's

Continued on page 90

oesn't have to be a gamble.



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AUSTIN·TEXAS

Differentiate between 'slips' and 'mistakes'

In testing your software design for usability, you will notice end users making two different classes of errors. Don Norman of the University of California at San Diego classifies them as "slips" and "mistakes."

A slip occurs when the end user's intent was correct but wasn't carried out as originally planned. A mistake happens when the end user carried out his intent but his action doesn't have the effect he had expected.

One easy way to tell the two apart is that after a slip, the end user frequently exclaims, "Whoops!" and then follows up by making a quick correction. After a mistake you'll often hear, "What the . . .?" whereupon he will sit perplexed, staring at the screen.

Two examples of slips are typographical errors — "typos" — and mode errors. While typing errors may be slips that occur randomly, if you notice the same typo being made repeated frequently, it signals a possible design problem to be remedied.

Changing horses midstream

This happens, for example, when a user who is accustomed to hitting a system's F10 key to execute the Do It command uses another computer, whose Do It function is activated by hitting the Return key.

Slips are not necessarily minor and may have serious consequences, as when a user presses A to delete All Files instead of S to delete Selected Files.

Any real mistake is serious in a test environment because it means the end user doesn't understand the system. The following are three possible mistake scenarios:

Unjustified confidence. The end user thinks he knows what's going on but is incorrect. In this case, testers need to find out what in the instructions, screen display or the user's previous experience is causing the problem.

How do I turn this thing on? The user knows perfectly well what he wants to do — for example, switch two columns in a report format — but he doesn't know how to specify the action that will achieve it. First, make sure the command choices are clearly defined. If no other problem can be found, a good context-sensitive Help function might bail out the user when he is in trouble.

Impasse. The end user understands neither what's happening nor how to proceed. Some users will freeze, some will request help, and others will try things at random in the hope of getting lucky. Testers should learn to spot this condition and distinguish it from controlled trial-and-error exploration.

BOB STAHL

Testing

CONTINUED FROM PAGE 87

mind and diagnose the cause.

This brings up the important question of when to intervene. Suppose we are testing a system of freeway signs. The user's instructions are to get to the airport. We see the user take the wrong exit. What should we do?

If we're videotaping, for example, do we continue to tape the user as he meanders through the countryside for several hours?

In the words of one tester, "It's easy to wind up with 60,000 feet of videotape, most of it useless, and no one to analyze it." More important, the chance to find out what the subject was thinking at the time is gone.

The opposite problem occurred at a testing session I attended recently. A developer had been stationed in the room with the subject, largely to prevent such situations.

The results were again worthless, because the temptation to coach was irresistible: "No, you see, first you have to get a list of your work sheets. Press F7, and it'll show you one. There! Now press F4. . . ."

Knowing when to help

Even if we avoid the extremes of ignoring the user or coddling him with too much coaching, there is still the question of when and how to intervene.

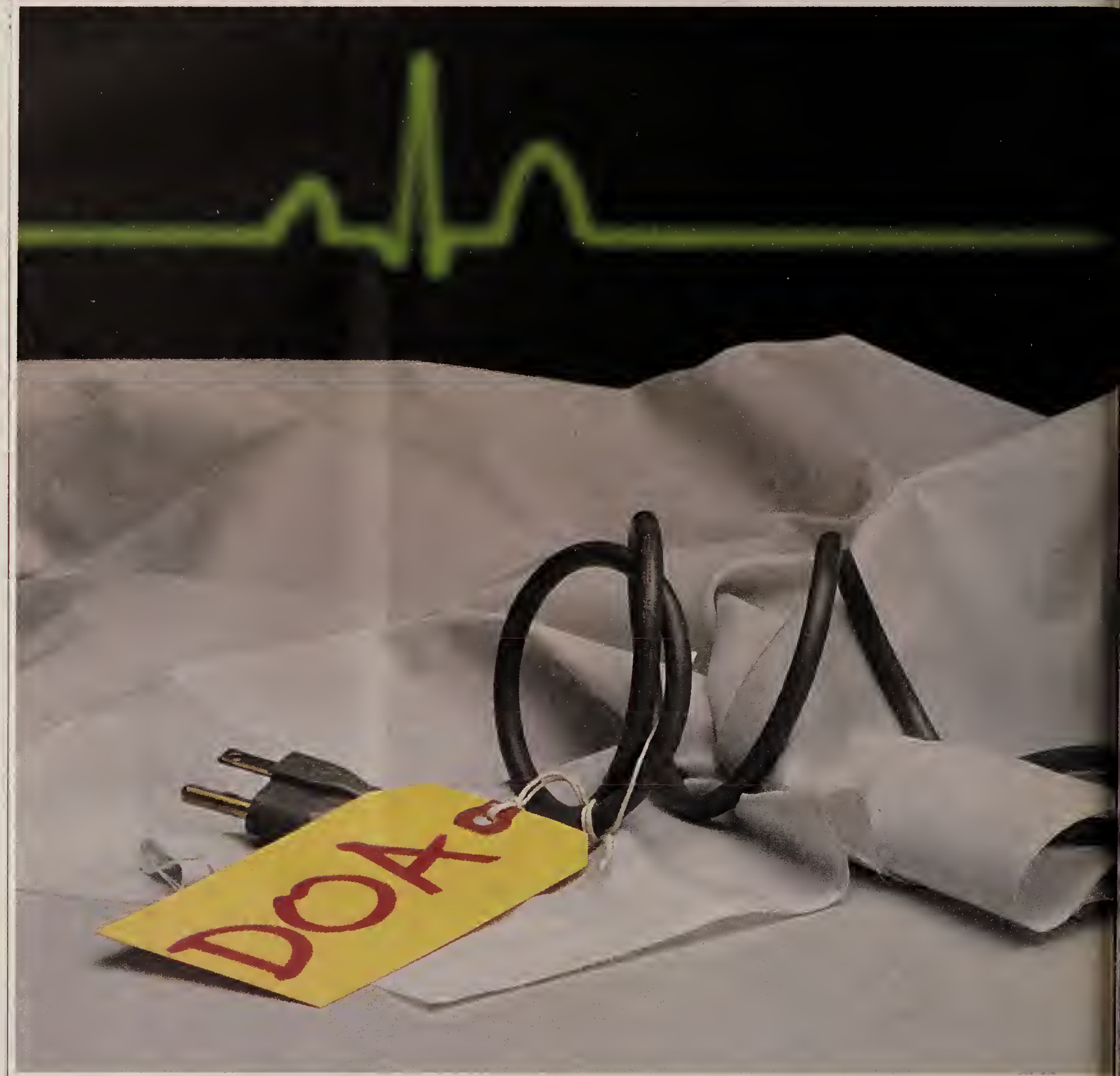
In our freeway sign analogy, the user may take the wrong exit but quickly realize this through other signs and see how to correct it.

The designers of one airport recognized this problem. If you deplane and head in the wrong direction, there is a large overhead sign that reads, "This is NOT the way to Baggage Claim. For Baggage Claim, go back and turn left."

To understand what the subject is thinking, we need to get him to verbalize his thoughts at the crucial points. Some labs place a sign over the terminal that reads "THINK ALOUD."

Unfortunately, not all subjects are comfortable doing this. An alternate approach is to place two subjects together in the room. As they talk to and speculate with each other, a lot of useful information can be gathered.

The best choice is probably to encourage subjects to think aloud but also to ask in a neutral tone, "Why did you do that?" when errors are made and listen carefully to the answer (see story above). To avoid conditioning them that this means "You



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just made a mistake," the question should also be asked randomly when the subject does the right thing. A side benefit of this line of questioning is that we find out how often end users do the right thing for the wrong reason.

IF THE system is beyond the early prototype stage when a problem is found, chances are the problem was caused by something the design did not anticipate. Programmers, being human, will then often look for the fix that means the least redesign work — not necessarily the one that is best for the end user.

Prescribing a fix

If the system is beyond the early prototype stage when a problem is found, chances are the problem was caused by something the design did not anticipate. Programmers, being human, will then often look for the fix that means the least redesign work — not necessarily the one that is best for the end user.

Consider a stretch of dialogue in which the user answers a series of questions. During testing, it is discovered that people are unsure of how to answer certain questions unless they can see their answer to a previous question and possibly change it. The testers suggest that the ability to back up be added.

If the design makes this difficult to do, what the end users may get instead is the ability to bail out at any point and answer the whole series of questions again. This is easier to program, but it is not a step forward for usability.

In this case, retest the fix and confirm its ineffectiveness. Next, try to be creative in suggesting alternatives.

For example, the system could display the end user's answers for review at the end of the series and let him change any of them. But for this to be effective, it is essential to tell the end user before the series starts that he will have the ability to do so.

Dealing with problems

When five or six representative test subjects have completed the test script, one of the following case results will emerge: "no significant problems," "potential problems" or "serious problems."

If there are no significant problems, repeat the test with another group of the same size. If that group experiences no real problems, we can turn our attention to performance time and end-user satisfaction.

If a potential problem occurs, several more groups will have to be tested in order to ascertain that a program change is justified. If the problem is experienced by more than 10% of the subjects, it should be fixed.

If serious problems do crop up with the first group of subjects, the difficulty will usually be obvious. It is a waste of time to test more people until changes have been made.

End-user satisfaction

Experienced managers stress one hard-learned lesson: If people don't like a system, it will eventually fail. They'll complain about it, avoid using it and sabotage it until the beast finally dies. Upper management has a long memory for how much such a system cost, who built it and who said it would work. Therefore, measuring end users' subjective satisfaction is not an option but an imperative (see story page 92).

After the test, be sure to interview the evaluators, either individually or in a group. Interviewing holds two advantages over handing out questionnaires. First, it affords the opportunity to follow up on why the subjects feel as they do. And equally important, the results can be recorded.

On the other hand, some testers feel they can obtain more candid answers by using a brief written questionnaire. Candor becomes a problem in two types of corporate cultures that are at opposite poles from each other.

In repressive organizations, the problem is obvious. But the problem also occurs in very upbeat companies in which great enthusiasm follows everything that is produced.

Whether asked verbally or on paper, the key question is simply, "Overall, how did you like the system on a scale of 1 to 10?"

Eventually, a baseline of test data will be built up that lends the interpretation of this score more objective credibility. If you have no baseline, ask employees the same question about existing systems they use. It will soon become clear that a system should have a score of at least 7.5 and that anything under 6.5 means trouble.

The baseline data should be large enough to eliminate any hidden agendas end users might be holding onto. Still, it is not a bad idea to search for these biases during the debriefing interview after the usability test.

The classic example is the end user who would be unsatisfied no matter what you showed him because "no system could possibly do my job."

On the other side of the coin, some end users will welcome any system for being

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better than what they have or as a sign of management's paying attention to their cause.

The politics of testing

Few activities in an organization are immune to politics, and testing is no exception. Problems can arise from several sources.

The developers have put a great deal of effort into the system. When problems are discovered, it takes an egoless saint to feel no implied criticism of his design ability. In addition, changing the design means more work. Getting usability acceptance test criteria — negotiated by the developers — into the initial project charter helps developers view testing as an aid to meet the goals they have committed to instead of as a set of hurdles to overcome.

Managers are the second group that needs attention. Problems revealed by testing can mean schedule slips — requiring managers to make explanations to their own supervisors. Managers who have been around the block a few times realize that it is better to release a clean system that meets with wide acceptance instead of one they will regret having approved.

Finally, there are the end users who have been chosen as system evaluators. Not all of their suggestions can be included in the final system. There is the issue of user preference vs. performance, and there are many other design trade-offs that must be weighed. It is natural that those whose ideas are not incorporated may feel resentment.

The best approach is to be honest and explicit before users begin their evaluation. They should be told, "Of course, we won't be able to make every change that is suggested. We need your input, and every idea will be carefully considered. We'll try to do as much as the schedule permits."

Effective usability testing is not something that happens at the end of a project; it is a continuous process that occurs throughout the system development cycle.

Testing the code is not enough; usability testing is critical for ensuring the system's success. It can nip a myriad of problems in the bud, benefiting users and developers alike. •

Find out why

If the end-user evaluators don't like a system, we need to find out why. Sometimes the reason is straightforward. In other instances, the subtlety of some aspects of usability escapes designers, underscoring the need for testing.

Several years ago, Edith Samers, now with Chase Manhattan Bank NA, built a system for a public-access terminal that helped users find restaurants in New York that matched their preferences. Users specified three criteria: cuisine, location and price. The system would then list those restaurants that met the criteria.

Although it worked perfectly, testing revealed that most people didn't like it. The problem turned out to be that, initially, only several hundred restaurants signed up to be listed. Users would usually receive only one or two names that met their criteria, and this was psychologically unsatisfying.

A creative solution was found. "We removed price from the set of criteria and, instead, listed prices next to the names of restaurants that met the other criteria," Samers says. "Users now received a list of six or eight names, which was what they expected. We also discovered that people were more flexible about price than we thought they'd be."

BOB STAHL

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MANAGEMENT

TAKING CHARGE

David Ludlum

Dogfight intensifies

There are things they don't teach you at Harvard Business School and things they usually don't teach you in the conference keynote talks in which prominent MIS executives deliver speeches extolling the strategic use of information systems.

One of the things not often heard at such talks concerns sustaining a competitive advantage that has been won through the deployment of a strategic information system, which is often a staggeringly expensive undertaking.

But that issue has come under the spotlight recently because of a legal dispute between American Airlines and Texas Air, the leading players in perhaps the most expensive information systems competition yet — the battle among airlines' computerized reservation systems.

At issue is the hardball competition that strategic use of information systems can involve — the focus of suits and countersuits filed by American and Texas Air in the last two months.

The legal actions address the contract terms that have been used to discourage travel agents from switching from one reservation system to another and the efforts used to persuade agents to do so.

In an interview, one spokesman for a travel agents' trade as-

Continued on page 95

Climbing the rungs to the top

Keypunching, night school didn't bog down Ocean Spray MIS exec

BY JAMES CONNOLLY
CW STAFF

PLYMOUTH, Mass. — Tom Modestino points with quiet pride to where he has come from — up through the ranks to a top MIS job in a Fortune 500 company.

He has done just about every job in a DP shop, which he says helps a manager in numerous ways, such as understanding the hardships of working the overnight. And he did those jobs while earning two college degrees.

He displays a soft confidence in easily talking about mistakes he has made and, according to a former manager, letting his subordinates take credit for their own accomplishments.

Modestino, the 42-year-old MIS director for Ocean Spray Cranberries, Inc., smiles in embarrassment when he tells how he "blew" an English exam at Quincy Junior College in Quincy, Mass., in 1965. That mistake meant leaving school and dropping his goal of being a teacher. Two months later, a draft notice led to a U.S. Army uniform and a year in Vietnam.

It's academic

Modestino envies his two high school-age sons who are now making their own college plans.

"I've been interested in the data processing business since 1968, when I got out of the service," he says. "You have to keep in mind that back in those days, working with computers required both mechanical and electrical abilities. Being the kind of guy who liked to tear a car apart on Saturday and put it back together on Sunday, computers caught my attention."

Modestino entered DP as a temporary worker running an electronic accounting machine at a Boston-area machine shop. He stayed long enough to be trained on an IBM System/3 before he became expendable when the company changed its DP plans.

He worked as a computer operator and programmer in a Quincy machine company and then as DP manager for a Boston millinery company, working 70 hours a week doing whatever had to be done — even keypunching. "I was manager of a small shop, and I still think that's the toughest job in this business," he says.

He learned two key lessons during that year and a half. "I started to get a better appreciation of the business I was working for and not just the DP portion of it, and I reconciled at that time that I never wanted to be a small shop manager again. I would rather be a little fish in a big pond," he says.

To be a little fish, he took a lesser title as systems analyst with New England Nuclear Corp. of Boston, which produced radioactive materials for medical purposes.

Modestino cites his 11 years at New England Nuclear as a learning experience. He advanced to manager of systems and programming and watched

Continued on page 94

PROFILE

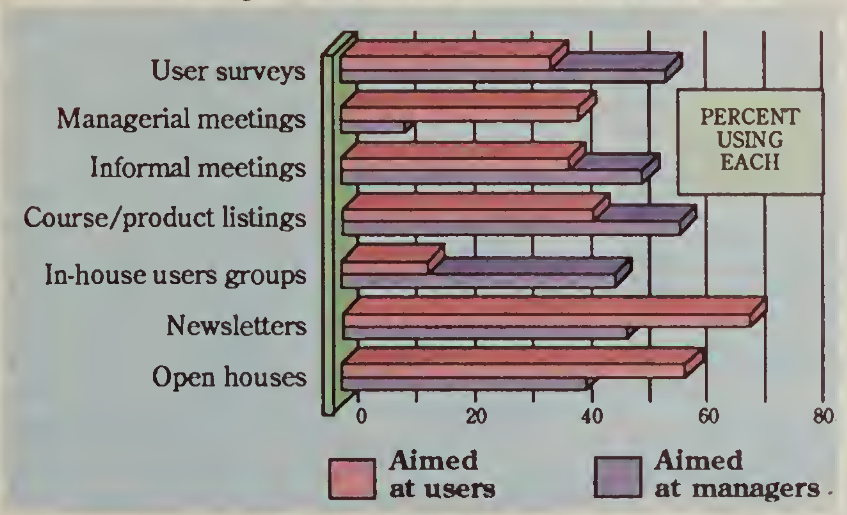
Tom Modestino

Position: *MIS director, Ocean Spray Cranberries, Inc.*
Mission: *Managing data as a corporate asset, getting more involved in strategic planning, helping fend off competition.*

Data View

The information center pitch

Methods of internal marketing of information center services to users and managers, from a survey of 450 information centers



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CW CHART

Wanted: Full-time contingency planners

BY DAVID A. LUDLUM
CW STAFF

Barely a month goes by that the Association of Contingency Planners is not asked to share a job description, often with a company making contingency planning a full-time position, according to the association's chairman.

The requests are one indication of the recent growth in employment of full-time contingency planners, particularly in data processing organizations.

"In data processing and also in corporate environments, it's growing unbelievably as a full-time occupation," says Dianne C. Smith, the association's chairwoman.

Another indication is the group's growth from a local Los Angeles organization to a network of four chapters, with two more expected to be created by year's end and 18 others being planned.

But some are not as bullish on the contingency planning field as

Continued on page 96

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Director

CONTINUED FROM PAGE 93

the company and computer technology boom. The firm grew from 200 employees to 2,000.

In 1981, Du Pont Co. acquired New England Nuclear and Modestino began job hunting out of fear that Du Pont would gut his MIS operation. He took a job as MIS manager for a medical instruments supplier, where he stayed for a year before another corporate takeover sent him to Ocean Spray.

Modestino joined Ocean Spray, a food processing cooperative best known for fruit juice, as manager of financial systems development when the company was converting from a Burroughs Corp. minicomputer to an IBM 4331. Ocean Spray later upgraded to an IBM 3081. In 1984, Modestino became MIS director when the previous director, Arch MacIsaac, rose to vice-president for logistics.

"When I first came here, Tom was running the financial systems. I was literally able to not worry about the financial systems and focus my attention on the logistical systems and new business systems we were bringing up," MacIsaac says.

Pursuing education

While advancing his MIS career, Modestino was pursuing the education he had missed earlier.

"When I was at New England Nuclear I recognized that I didn't need a degree to move up within that company. But I knew that I needed it if I wanted to go somewhere else," he says.

He began taking evening classes at Boston's Northeastern University in 1971 and graduated with a bachelor of science degree in MIS in 1978. He earned a master's degree in business administration at Leslie College in Cambridge, Mass., in 1983.

Modestino lists majoring in MIS as a mistake, because he already knew much of what the classes covered. He says training in finance or marketing would have helped him today in negotiating contracts or dealing with sales plans.

Attending college and working long hours was hard when his sons were young. He enjoys sailing off Cape Cod but says he gave that up to spend more time with his family at a summer home on a lake near Plymouth, Mass.

Modestino credits his manager at New England Nuclear, Arnie Canner, with driving him back to school. Canner says Modestino's growth potential was hurt by not having a degree in a company that judged workers in large part by degrees. "Tom had the smarts, but I knew that if I got promoted he would have a tough time getting my job without a degree."

Canner remembers Modestino in two lights. "One, he was honest. He was a straight shooter. Two, he was technically competent and willing to push for new technology, not for the sake of having a new black box but because the black box was good."

Expanding on the honesty, Canner notes that Modestino was open when it came time to look for a new job. "How do you tell your boss you are out looking for a job? He could say that kind of thing and know that his contribution to the company allowed him to be honest," Canner says.

'A classically good manager'

He also praises Modestino's approach to people who work for him. "If you haven't been at the bottom rung, it's pretty tough to know how people feel. I think he had learned a lot about how not to treat people because he had been treated that way in his previous job," Canner says. "Tom's a classically good manager. He plans and he sets objectives. If his people screw up he takes the blame. If they do well, he lets them take the praise."

MacIsaac adds that Modestino's through-the-ranks experience is not crucial at the director level — but it helps. He says Modestino's strengths are a talent for managing people and understanding business.

Modestino says he hopes to expand his involvement in strategic planning. A key to that planning, he says, is recognition of data as a corporate asset, which Ocean Spray discovered in its analysis of market trends.

Ocean Spray, with revenue of $631 million for fiscal 1987, is big enough for larger food processing companies to target. "We have to be ready for them," Modestino says.

He says that one of the challenges he had to overcome in his early days as a manager was recognizing how to delegate responsibility. He also has risked alienating his technical staff by rejecting projects when he believed a technology was exciting but not cost-effective.

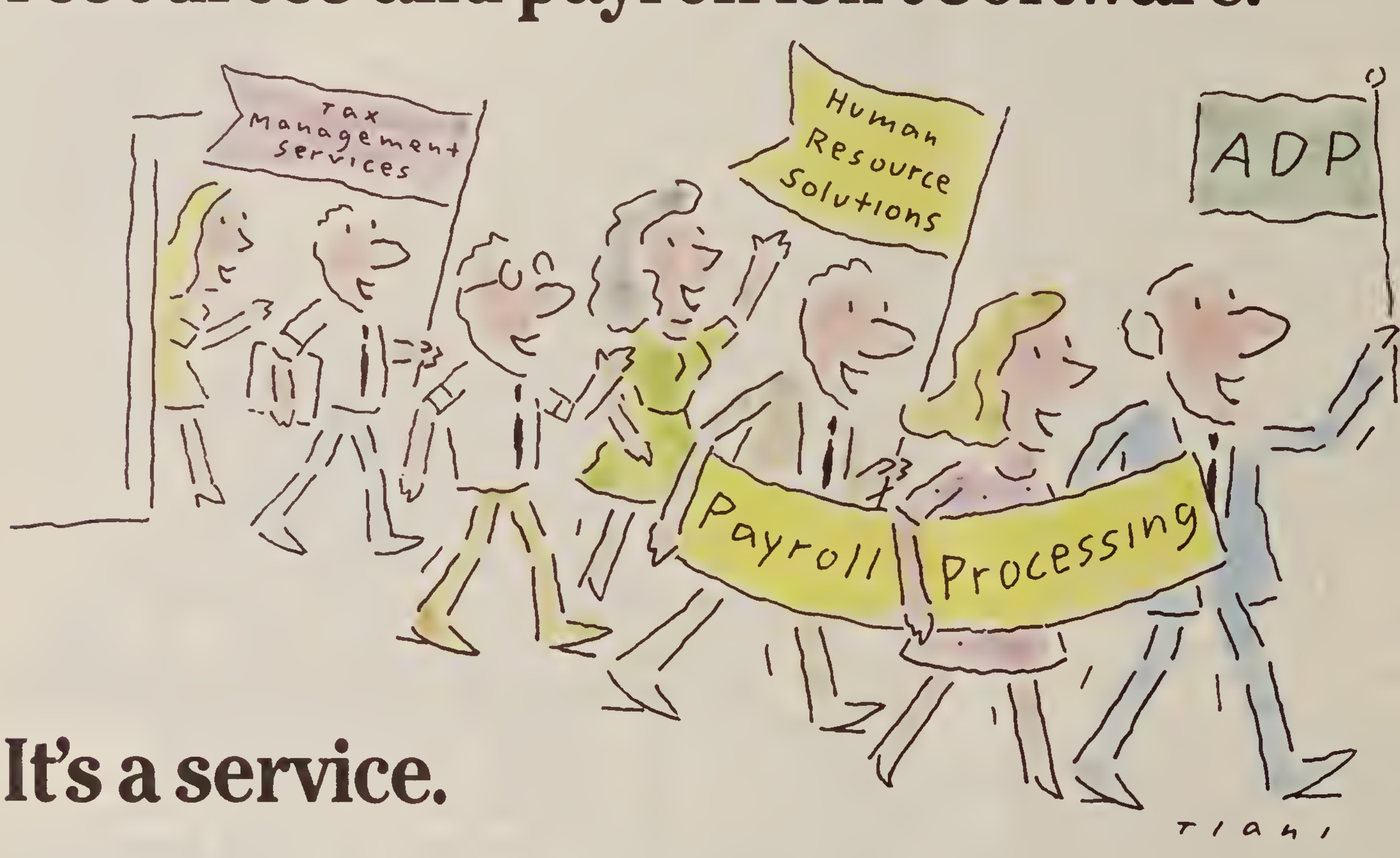
Fooled by PCs

He admits that one technology surprised him the way it caught other managers. His 1983 thesis at Leslie College said personal computers did not belong in business. But he defends that position by noting that no one could have predicted PC prices would drop as they did or that peer pressure would play such a strong role with people feeling the need for micros.

Modestino says PCs have brought relief to MIS managers because they do tasks that might have used up a mainframe in the past. He cites the case of a PC-based application that maps cranberry bogs. It would have required a mainframe four years ago.

He also points with pride to a marketing executive using a PC every morning to analyze sales data processed on MIS's hosts the night before.

The best MIS solution for human resources and payroll isn't software.



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CONTINUED FROM PAGE 95

sociation described the terms as "onerous" and "extremely lopsided in favor of the vendor."

One term is the so-called rollover clause, which requires travel agencies to enter into new, exclusive five-year reservation system contracts whenever their equipment is upgraded.

Another concerns the liquidated damages that agents who break a contract must pay to a supplier in addition to payment for lost fees and removing equipment.

The damages compensate for payments that hotels, car rental agencies and other airlines would have paid a supplier for reservations an agent might have made through that supplier's system.

Another contract term offers extra commissions from the supplier for reservations for its own flights that are made through its system, coupled with threats to withhold extra payments if a travel agent uses a rival system to book the flights.

With the value of the strategic use of information systems accepted as gospel, ensuring that a competitive edge can be maintained is a key issue facing those who might wield the strategic weapons. Some efforts have proved more lasting than others.

Keeping a competitive edge

Academics and consultants have delved into this issue. The Wharton School of The University of Pennsylvania professor Eric K. Clemons, writing in this space last year, set forth the following conditions under which a competitive advantage can be sustained:

- An inability by competitors to duplicate the competitive advantage or keep up with it.
- The competitors' inability to benefit from duplicating it.
- A lack of interest on the competitors' part in duplicating the advantage.
- Effective capture of a market before the advantage can be duplicated and a lack of interest on the part of customers in switching to another provider.

But that column neglected the condition that has been underscored by the legal dispute between American and Texas Air: hardball contract terms.

The legal scrap between the carriers may shed some light on this approach.

One argument concerns whether the contract terms violate a 1984 Civil Aeronautics Board ruling.

That ruling made it illegal for suppliers of the reservation systems to discourage travel agents from switching from one system to another.

Congress may also address the issue, depending on the final form of the Airline Passenger Protection Act, now awaiting action by a conference committee.

Perhaps the first lesson to be gleaned from the dispute is that it offers yet another reason for information systems managers to think like businessmen rather than technologists.

The use of strategic information systems calls for technical virtuosity, but it also leads to the not-completely charted world of business, where survival can depend on aggressiveness and lawyers.

Ludlum is *Computerworld's* senior editor, management.

LOCAL HAPPENINGS

NORTHEAST

Newton, Mass., Dec. 17. Society for Information Management, Boston Chapter. Monthly meeting. Newton Marriott, Route 30. 11:40 a.m. Contact: SIM, P.O. Box 116, Newton Lower Falls, Mass. 02162.

Boston, Dec. 18. Society for Management of Professional Computing. The Changing Role of Desktop Publishing. Anthony's Pier Four. 11:45 a.m. Contact: SMPC, 715 Boylston St., Boston, Mass. 02116.

New York, Jan. 13. Association for Women in Computing, New York Chapter. Documentation for Hardware and Software panel discussion. Manufacturers Hanover Trust, 270 Park Ave. 5:30 p.m. Contact: AWC, P.O. Box 2293, Grand Central Station, New York, N.Y. 10163.

Harrisburg, Pa., Jan. 13. Association for Systems Management (ASM), Central Pennsylvania Chapter. Local Area Networks, with Thomas Slick of Tasco, Inc. O'Hara's Restaurant. 5:30 p.m. Contact: Mark Anderson, 809 Acri Road, Mechanicsburg, Pa. 17055.

Bangor, Maine, Jan. 20. Data Processing Management Association (DPMA), Maine Pine Tree Chapter. Leadership Qualities, with former Gov. Ken Curtis. The Bangor Hilton. 5 p.m. Contact: J. Fieweger, Delta Chemicals, Inc., Searsport, Maine. 04974.

SOUTHEAST

Charlotte, N.C., Dec. 17. ASM, Queen City Chapter. The Miracle of Motivation, with George Shinn of George Shinn & Associates. Cosmos Steak House, 5100 East Independence Blvd. 6 p.m. Contact: Robert Yearwood, Metro Information Services, Suite 140, 7 Parkway Plaza, Charlotte, N.C. 28217.

Lafayette, La., Dec. 17. DPMA, Acadiana Chapter. Monthly meeting. Evangeline Steak House, Highway 167 S. 6:30 p.m. Contact: Debra Billeaud, Guaranty Bank and Trust Co., 4th Floor, 200 W. Congress, Lafayette, La. 70502.

Chamblee, Ga., Jan. 12. ASM, Atlanta Chapter. Data Planning Concepts, with Barbara Helmer of Data Architects. Holiday Inn Chamblee-Dunwoody, 4386 Chamblee-Dunwoody Road. 5:30 p.m. Contact: Jane Roberts, HBO & Co., Suite 1000, 1 Ravinia Drive, Atlanta, Ga. 30346.

MIDWEST

Kalamazoo, Mich. Dec. 13. DPMA, Southwestern Michigan Chapter. Penalty for Early Withdrawal, with The Civic Players. Kalamazoo Civic Theater. Contact: William J. Hosken, The Upjohn Co., 7171 Portage Road, Kalamazoo, Mich. 49001.

Dayton, Ohio, Dec. 15. ASM, Megacity Chapter. Holiday program. Dayton Marriott, 1414 S. Patterson Blvd. 5:30 p.m. Contact: S. Beebe-Owen, Western Ohio Pizza, Inc., 2324 Stanley Ave., Dayton, Ohio 45404.

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Planners

FROM PAGE 93

Smith. "Most of the companies I have association with do it on a part-time basis," says Jack Bannan, who is cofounder of the 5-year-old Delaware Valley Disaster Recovery Information Exchange Group. Bannan advocates the hiring of full-time contingency planners.

"Since five years ago, when we started the group, I think there's been a move in that direction, but not a dramatic move," says Bannan, manager of information security for RCA Corp. "If you look in the want ads, you very rarely see an ad for a disaster recovery person."

But the popularity of the two professional groups and nearly a dozen similar ones is testimony to growth in the field, particularly among smaller companies.

> CONTINGENCY planners work within departments as varied as MIS operations, data security and corporate administration.

The development is attributed in large part to government regulations requiring federally chartered banks and thrift institutions to have disaster recovery plans. In 1983, the U.S. Comptroller of the Currency required national banks to have such plans, and last year, the Federal Home Loan Bank Board issued specific guidelines for savings and loan and thrift institutions. Many federal government contractors, too, are required to have disaster recovery plans.

"It seems to me that those industries that are mandated tend to drive those that are not," says Smith, a contingency planner at a major financial institution.

The rapid growth of end-user computing has also prompted a greater need for contingency planning, according to Judith Hinds, who plans programs for the Contingency Planning Exchange of New York.

Spice of life

The scope of contingency planning positions tends to vary widely among companies. Some planners are regarded as specialists or professionals, some as managers. Some concentrate on DP; others address broader business functions. Planners work within departments as varied as MIS operations, data security and corporate administration.

"In most instances it is tailored to the particular company, because each company is going to be different," says Hinds, a contingency planner for The Depository Trust Co. of New York.

Educations also vary, according to an informal member survey by the Association of Contingency Planners. Of the survey respondents, 8.5% had a master's degree, 38% had a bachelor's degree, 27% had a junior college or associate's degree and 17% reported a high school education.

Most of the respondents — 60% — said they earned between $35,000 and $60,000 a year when the survey was conducted last year, and 14% reported earning more than $60,000 a year.

Wanted: people people

While contingency planning requires working with technical people, a general background, including communications skills, is a strength because of the need to work closely with upper management, according to Hinds.

"You need someone who can do that, because [upper management] is going to have to make significant resources available to protect the company," she says. She cites planners who previously worked in auditing, general administration or in a series of varied assignments.

Smith also underlines the need for interpersonal skills on the part of contingency planners. "There are days when no one wants to see you coming, because they know you're not going to be bringing good news," she says.

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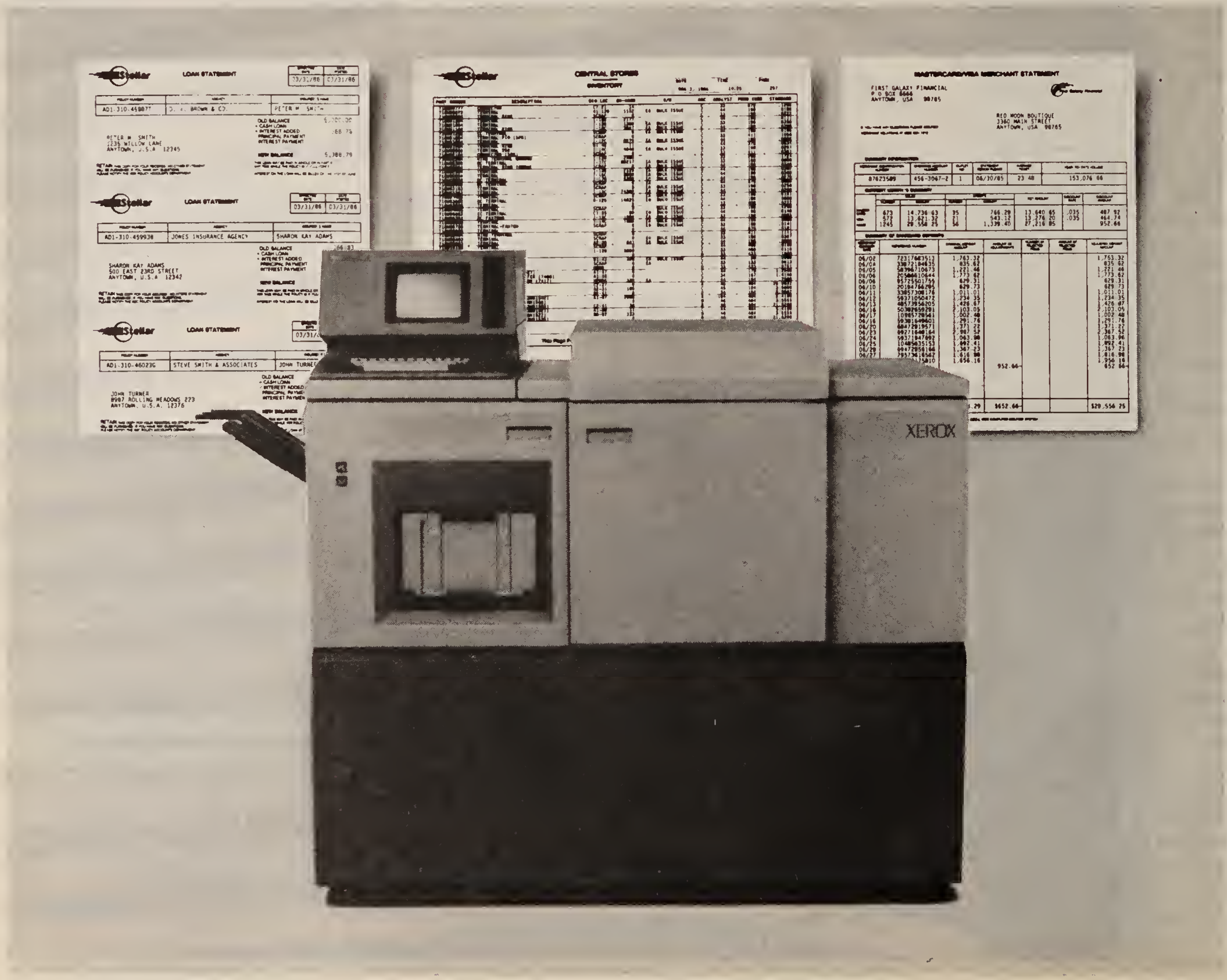


COMPUTER INDUSTRY

INDUSTRY
INSIGHT
Clinton Wilder

Positive thinking

Recession-proof? The computer industry, now in the home stretch for this year, is still gazing over its shoulder at the long shadow of Oct. 19. Within the last few weeks, IBM's John Akers, DEC's Ken Olsen and just about every other chief executive officer making a public appearance have attached a verbal asterisk to their relatively rosy 1988 growth forecasts.

But while the industry gets nervous about economic conditions causing a drop in corporate capital spending, Paine Webber mainframe and minicomputer analyst Stephen Smith maintains that this way of thinking may be all wrong. In a November research report, Smith closely analyzed U.S. Department of Commerce data and concluded that even though capital spending may drop, spending for computers as a percentage of capital outlays is likely to increase.

Smith projected that U.S. computer sales will grow 11% in 1988; but even if there is a recession, and the U.S. gross national product falls by 2%, computer sales will still grow by about 5%. This bullish outlook, however, contains one caveat in the opening line of Smith's report: "Provided that today's connectivity and productivity problems are effectively resolved. . . ." Amen.

Sayings from Chairman John. Akers, a witty public speaker, got a hearty laugh at a meeting last month with securities analysts when discussing the market crash. The IBM chairman said he'd made a bet with a friend in 1986 on where the Dow Jones industrial average would be one year later. Akers lost the bet; he underestimated the bull market, and his prediction was about 500 points too low. "I missed it by one day," he deadpanned.

Consortium courting. High-tech research consortiums are still hot items, judging by the wooing of the 13-firm semi-

Continued on page 104

Dickerson center of tug-of-war

Microsoft battles to keep key employee, trade secrets away from Borland

BY STEPHEN JONES
CW STAFF

SEATTLE — The microcomputer software war raging between Microsoft Corp. and Borland International has found its way into the courts, where both companies are fighting over a key former Microsoft employee who has joined Borland's ranks.

Microsoft is seeking to prevent Rob Dickerson, the former marketing manager of its flagship line of language products, from spilling trade secrets to his new employer.

In a complaint filed in Washington Superior Court last week, Microsoft charged that Dickerson has violated an employment agreement he signed that prohibits him from competing with the company's business for one year following his departure.

Dickerson resigned from Microsoft Nov. 13 and started working Nov. 17 as vice-president of product management at Scotts Valley, Calif.-based Borland, a Microsoft representative said.

Secrets

Microsoft claims Dickerson "would not be able to perform any meaningful employment for Borland" without discussing proprietary information and trade secrets, according to court records.

If Borland can hold on to Dickerson, it would represent a significant victory in its battles with Microsoft for dominance in the micro languages market. As group marketing manager for languages — from Basic to Cobol — Dickerson was a prominent figure on Microsoft's front lines.

"Rob is a key figure in market and product strategy for one of Microsoft's core areas," said Michael Goulde, an analyst with The Yankee Group in Boston. "You don't lose a key person like that lightly."

Acting restrained

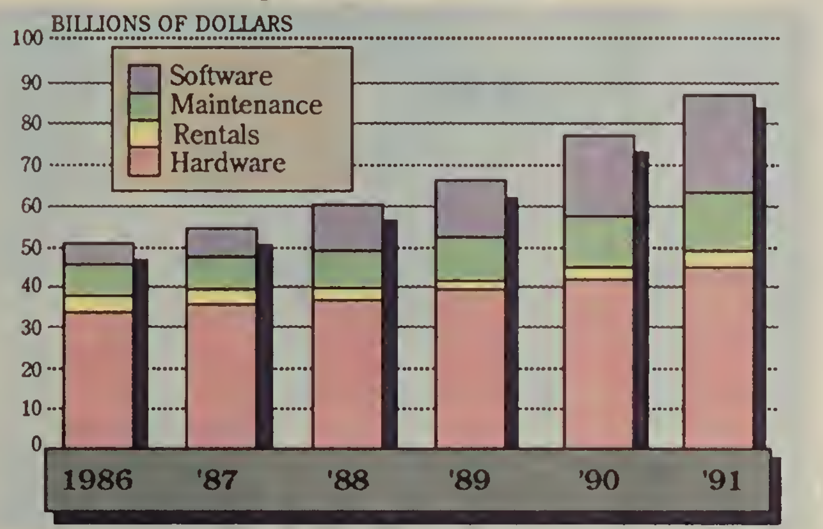
On Nov. 20, just three days after Dickerson joined Borland, Microsoft was granted a temporary restraining order that restricts Dickerson from working with any language, macro language or data base product,

Continued on page 102

Data View

IBM's soft touch

A 33% annual software growth rate is projected to fuel 11% annual overall growth between 1986 and 1991



INFORMATION PROVIDED BY ANNEX RESEARCH
CW CHART

White knight beau emerges

BY ALAN ALPER
CW STAFF

HORSHAM, Pa. — Decision Industries Corp.'s board of directors last week recommended that shareholders accept a friendly takeover offer of $8.75 a share from a New York investor group as an alternative to the hostile bid from leasing firm Econocom International N.V.

The recommendation came after Econocom, which has waged a two-month hostile takeover attempt of Decision Indus-

Continued on page 107

The idea is super, but will it sell?

BY JEAN S. BOZMAN
CW STAFF

MINNEAPOLIS — What type of commercial customer would be attracted to a 23 million floating-point operations per second computer for slightly less than $1 million?

Many types, according to Carl Ledbetter, chief executive officer of Control Data Corp.'s ETA Systems, Inc. supercomputer subsidiary. The situation is one Ledbetter likens to that of the introduction of the Xerox copier in the 1950s, when marketers were impressed by the new technology but wondered whether there was commercial value in it.

"We believe there is so much demand for small supercomputers that they will proliferate like the superminis did in the 1970s," Ledbetter asserted in an interview late last month at ETA headquarters.

Among the candidates for the technology, Ledbetter says, are automotive and aerospace corporations, petroleum compa-

Continued on page 100

Inside

- Bell Atlantic picks new president. Page 100.
- Proteon announces appointment of Courtin as president, CEO. Page 107.
- Edelman lowers Telex takeover bid. Page 107.

Maxtor CEO looks beyond current hard times

This has not been an easy year for Maxtor Corp.

The San Jose, Calif.-based 5¼-in. Winchester disk drive maker was unable to meet its 1987 manufacturing plan because of production difficulties at its single source for thin-film read/write heads, Read-Rite Corp. As a result, Maxtor's revenue dipped by about $15 million during fiscal 1987, its profits dropped every quarter, and 60 workers in its San Jose plant were recently laid off.

George Scalise walked right into the Maxtor fire when he became president and chief executive officer of the company in July. But Scalise had learned quite a few things about business adversity as senior vice-president of Advanced Micro Devices, Inc. during the worst semiconductor slump in history.

Scalise discussed the issues facing Maxtor and the hard disk drive industry with West Coast correspondent James A. Martin last month.

What is the current status of your manufacturing problems that resulted from the Read-Rite situation?

We're doing substantially better in terms of the number of heads we're receiving and the products we're building. But I'm not yet prepared to say that the problem is completely behind us.

George Scalise

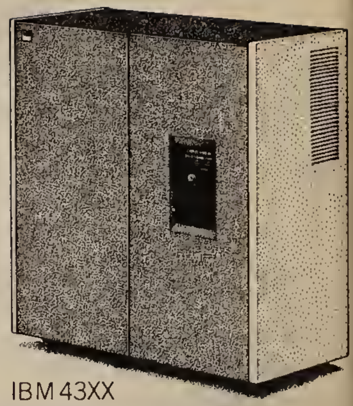
To give you some idea of our progress, in the September quarter, we produced over 5,000 drives of over 200M-byte capacity — an increase of about 30% over the prior quarter. As far as thin-film heads are concerned, in the month of September, we received over 120,000 thin-film heads, an increase of 46% over the month of June. So we're making progress.

What happened to Maxtor's line of 3½-in. offerings? You were set to introduce some 3½-in. products earlier this year, but they never came out.

Our 3½-in. program is still in development, and we hope to bring out a product in the middle of 1988. As we were solving some of the problems associated with the read/write head issues, we

Continued on page 104

The company with the right connections for



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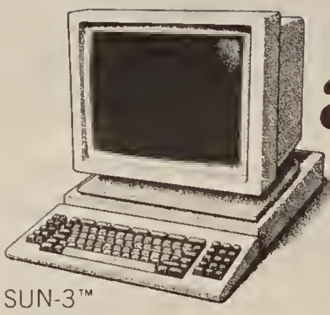

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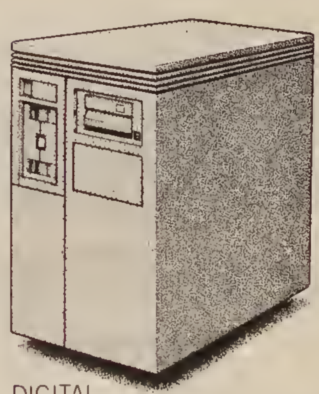

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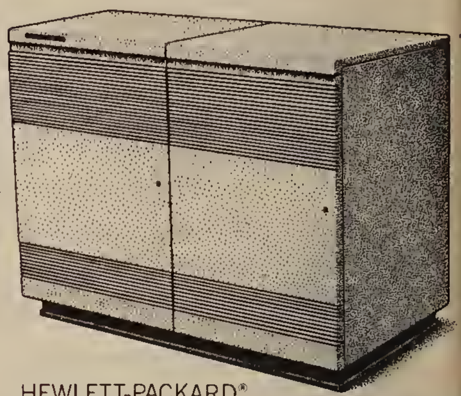

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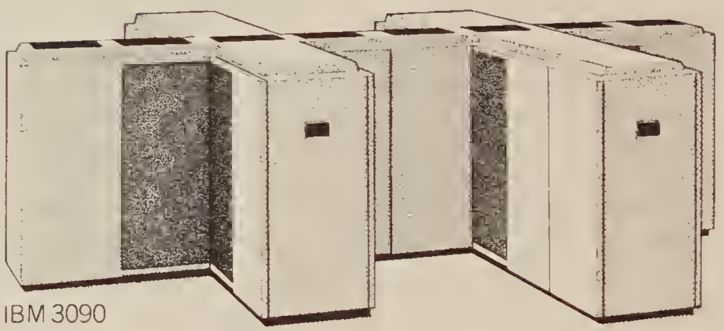

IBM 3090
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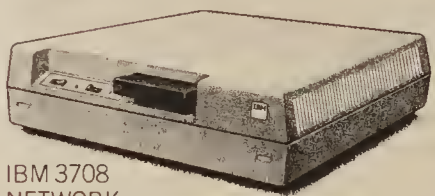

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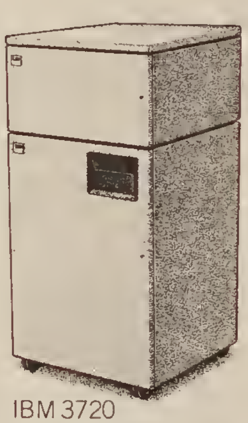

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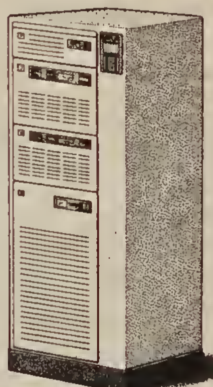

IBM 9370
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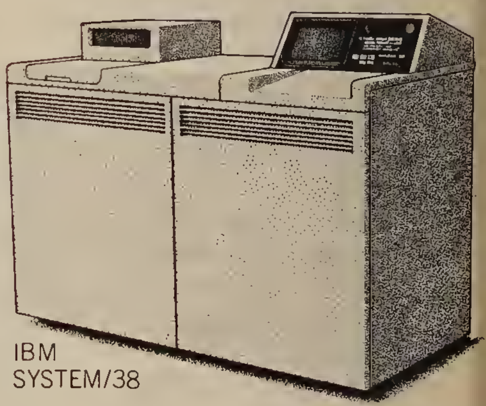

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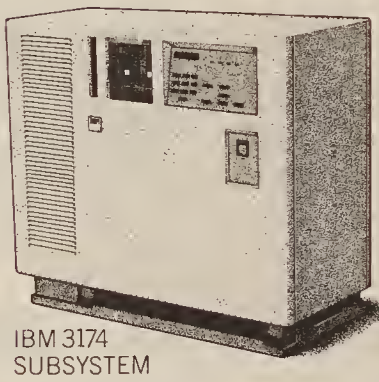

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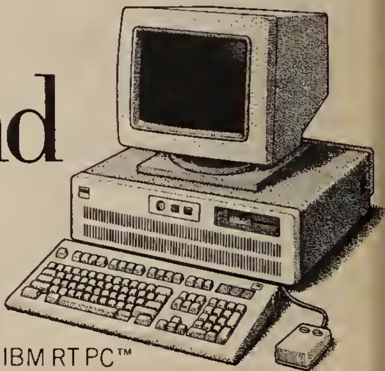

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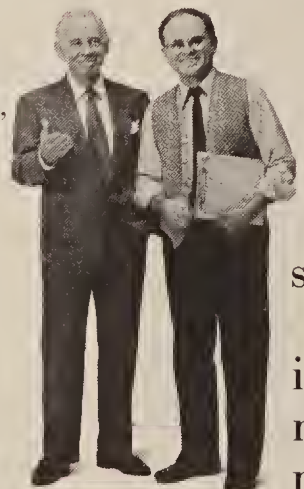
"It's great to be well-connected."



The striking thing about this picture isn't that IBM can make each of these connections. It's that IBM can make all of them. (In fact, this picture represents just a few of the connections we've helped some of our large customers make.)

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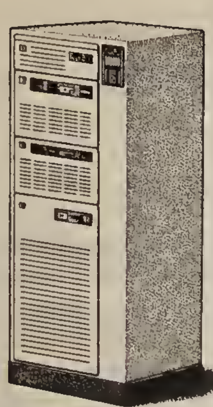
IBM 9370
INFORMATION SYSTEM

and

IBM 8232
LAN CHANNEL STATION
(TCP/IP GATEWAY)

and

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PERSONAL COMPUTER
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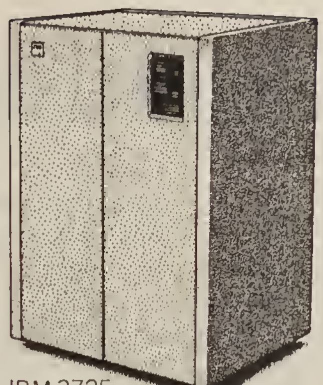
IBM 3725
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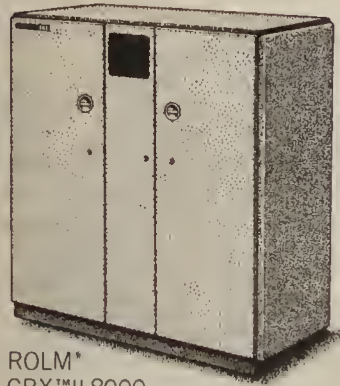
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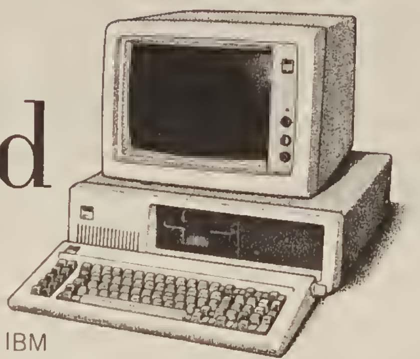
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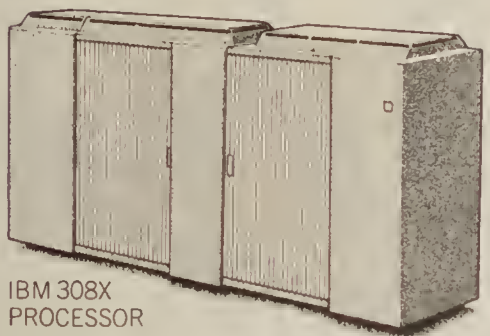
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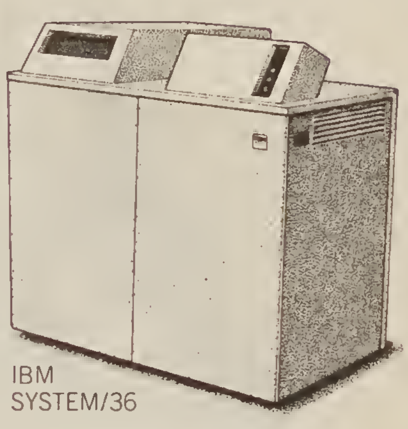
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IBM 4956
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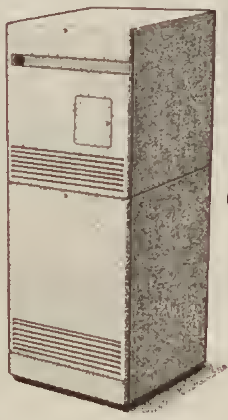
IBM 9751 CBX,
DEVELOPED BY
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IBM 3151
ASCII DISPLAY STATION

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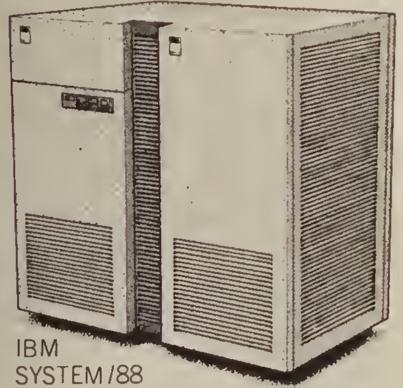
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Some of the connections shown above require additional equipment such as communication controllers, modems or protocol converters.

Reworked Bell Atlantic names high execs

BY KATHY CHIN LEONG
CW STAFF

PHILADELPHIA — In accord with its overall corporate restructuring, Bell Atlantic Corp. late last month named Raymond Smith to the new post of president and chief operating officer and Philip A. Campbell to the position of vice-chairman and chief financial officer. In their new roles, Smith and Campbell will report directly to Thomas E. Bolger, Bell Atlantic chairman and chief executive officer.

The selection of the key executives is the most important announcement in the restructuring plan, according to press spokesman Tom Healey. The appointments become effective Jan. 1, when the new structure will be in place.

Healey said the company changes will be mainly administrative. Instead of operating individual strategy and policy committees for each of the telephone companies and nonregulated entities, those groups will be consolidated at a corporate level. The telephone company presidents will also be members of a new board of directors.

The effects of Bell Atlantic's reorganization will not be realized until next year. So far this year, there have not been any layoffs among the firm's approximately 80,000 employees.

Next year, Smith will lead both the telephone organization, known as Network Services, and the independent nonregulated Bell Atlantic Enterprise companies. Campbell will take charge of corporate administrative functions such as finance, mergers and acquisitions and strategic planning for both entities.

In keeping with traditional Bell appointments, both executives have similar roots in the Bell telephone organization. Smith currently serves as vice-chairman and chief financial officer of Bell Atlantic. Likewise, Campbell is currently president of Bell Atlantic Network Services.

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ETA

CONTINUED FROM PAGE 97

nies, chemical and pharmaceutical firms.

One other notable market lies to the west, in Hollywood, where more costly supercomputers from Cray Research, Inc. have been used to create sophisticated computer animation. And CDC, which will eventually sell the ETA-10 machines, already markets the advanced Silicon Graphics Computer Systems workstation — the CDC 910 — which is widely used by the film industry.

Before the smaller supercomputers from firms like ETA, Convex Computer Corp. and Alliant Computer Systems Corp. came along, many commercial applications would have been prohibitive because of cost.

With an entry price of $10 million to $15 million, the high cost of supercomputing kept the world's population of supercomputers at less than 200 through 1985. Typically, only government agencies, research laboratories and the largest automotive and aerospace companies could justify purchasing a supercomputer.

Now, Ledbetter says, a new price/performance curve is being established by the makers of small supercomputers. The air-cooled ETA-10 P is priced at $850,000 for the CPU alone and at $995,000 for a complete system.

The heart of the matter

The technology will sell the system, Ledbetter says. The entire product line comes down to the ETA-10 board — a single slab of silicon with 44 electrical levels etched into it. It is, in essence, a restatement of CDC's Cyber 205 supercomputer architecture implemented in custom-designed CMOS chips manufactured by Honeywell, Inc.

It was not always so clear that CDC technology was being transplanted to ETA. In the early days, it appeared that the small company would spin off into an independent, publicly held company.

Now, spokesmen say, it was an effort similar to IBM's independent business unit concept. "Control Data was supplying the money and the people," a company spokesman recounts. "But they were insulated from the bureaucracy, and there was always the idea that a public offering might be made for the company."

By the time the ETA-10 was ready to ship one year ago, ETA had become a wholly owned subsidiary of CDC, and the ETA-10 had become a replacement for the high-end Cyber 205 supercomputer. The arrangement was clear: the CDC sales force would sell the machines as CDC's high-end product.

Since then, about 10 systems have shipped, primarily to university sites such as Princeton University, which received a four-CPU ETA-10 late last month. The West German weather service owns another of the early machines.

Next year will tell whether ETA's marketing strategy has appeal in the commercial accounts in which MIS directors are looking for high-performance systems. But Ledbetter is already looking further down the road — to new systems that incorporate innovations from fiber-optic and superconductor technologies.

"We want the customer to be able to enter our product line anywhere — and to be able to upgrade smoothly and continuously through a twenty seven-fold increase in power," he says.

THE first time Tom Leffler and his team from Unisys met with Home Shopping Network they recognized a big idea whose time had come.

The idea was to start up a national cable TV channel to retail products directly to consumers. People would pick up the phone and order anything from garden hoses to diamond rings, right from their easy chairs, any time, night or day.

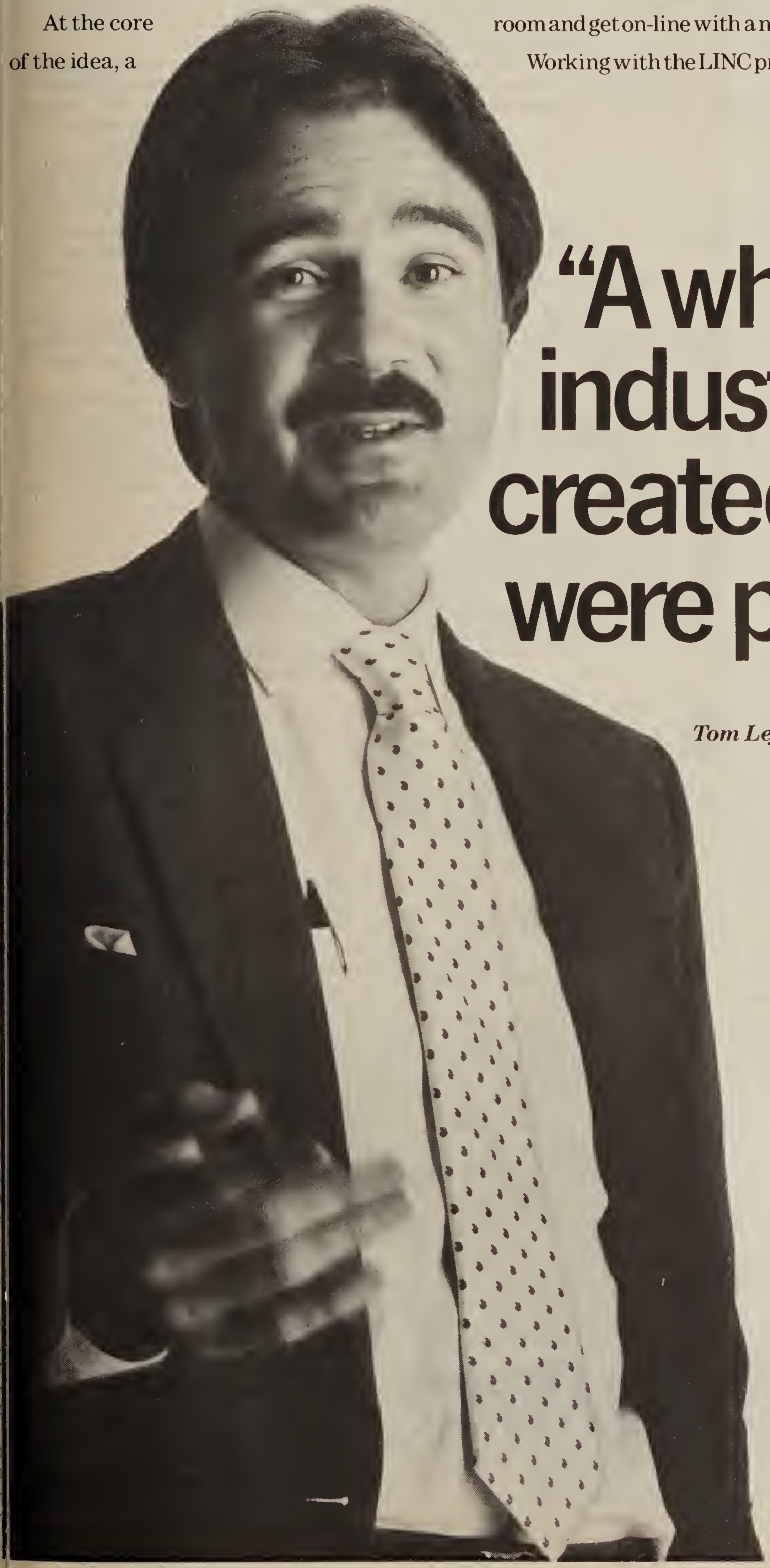
At the core of the idea, a computer system. A system that could satisfy their immediate needs, but could also grow, and fast. There would be no time for software conversions. And, if that system wasn't in place on time, that window of opportunity would slam shut.

"We started working with HSN in April 1985. They were scheduled to go national on July 1, 1985. There were three months to rewrite an application, build a computer room and get on-line with a national system."

Working with the LINC productivity tool and nine Unisys professionals, HSN had a working application in 90 days. In the next 18 months, they'd grown from zero revenue to almost $700 million. "And they'd grown from our smallest mainframe to our largest computers. It's been incredible.

"But, you know what really won us the business: Unisys' entrepreneurial attitude and a willingness to get things done. We accepted our challenge to be a part of the whole plan."

Unisys and distribution. The power of ^{2}.



"A whole new industry was created and we were part of it."

Tom Leffler, Marketing Manager, Unisys.

UNISYS
The power of ^{2}

MERGERS & ACQUISITIONS

On-Line Software International, Inc. announced the acquisition of **Software Technologies and Research, Inc.** (STAR) in Hartford, Conn., for $3 million. At the time of closing, $2 million will be paid, with the remainder to be paid over a period of two years. STAR is a consulting firm and vendor of CICS utility software. The company had revenue during the past year of more than $6 million, 80% of which was derived from consulting fees and 20% of which came from software sales.

Bell Canada Enterprises, Inc. (BCE) in Montreal and **Bell Atlantic Corp.** in Philadelphia signed a letter of intent for the sale to Bell Atlantic of BCE's European companies that are engaged in computer maintenance, product distribution and customized data applications.

Operating subsidiaries that would be included in the cash purchase are **Bell Technical Services Ltd.**, **Bell Communications Ltd.** and **Bell Services Ltd.**, all in the UK. Also included in the purchase would be **Eurotechnica SA** in France, **Eurotech Italia SPA** in Italy, **Dataway AG** in Switzerland and **Dataway** in Austria and West Germany.

Intelogic Trace, Inc. and **Texcom, Inc.**, both based in San Antonio, have entered into an agreement in principle whereby Texcom will become a wholly owned subsidiary of Intelogic Trace.

Texcom is a nationwide lessor that offers leases for computer systems manufactured by vendors including IBM, Digital Equipment Corp., Hewlett-Packard Co., Rolm Corp. and Compaq Computer Corp. Texcom's customer base includes Fortune 1,000 companies throughout the U.S.

Micropro International Corp. announced the acquisition of an Apple Computer, Inc. Macintosh product from **Challenger Software Corp.** in Homewood, Ill. The terms of the agreement provide for a payment of approximately $3 million over a period of three years and include joint development and marketing activities. Micropro said it expects to bring the product to market in the first half of 1988.

Challenger Software is best known for its 1986 release of Mac 3D, a graphics package for the Macintosh that simplifies the creation and editing of two- and three-dimensional graphics.

Tandem Computers, Inc. announced that it has made an equity investment in **Anamartic Ltd.**, a research and development firm based in Cambridge, England, that is developing advanced computer storage products.

Under the terms of the agreement, Tandem purchased a minority interest in Anamartic, a privately held company founded in 1986. Financial terms of the investment were not disclosed.

Anamartic made a breakthrough in wafer-scale integration with its Soft Wafer Interconnect architecture. The company's software approach provides more efficient use of a wafer's total area than does the traditional hardware approach.

Seagate Technology announced that it has acquired all of the outstanding shares of the capital stock of **Aeon**, located in Brea, Calif., for $3.9 million.

Aeon produces aluminum substrates used by Seagate Magnetics, a subsidiary of Seagate Technology, in the manufacture of thin-film magnetic recording media used in rigid disk drives that Seagate Technology produces.

Dickerson

CONTINUED FROM PAGE 97

which compose the bulk of Dickerson's new activities at Borland. Dickerson has not returned to work at Borland since the restraining order was granted. He could not be reached for comment.

Although Redmond, Wash.-based Microsoft named only Dickerson in its initial action, Borland jumped into the battle last week.

Borland and Dickerson filed an action in California Federal Court that claims Microsoft's employment contract with Dickerson is not valid in California, where Dickerson will be working.

With both cases in their initial stages, it was not clear last week whether Microsoft would move its complaint against Dickerson from a state court to a federal venue. Although Microsoft would not comment directly about the case, sources said the company will attempt to gain a permanent injunction preventing Dickerson from working in several product areas at Borland.

Dickerson, who holds an MBA from Harvard University, had worked for Microsoft since 1984. Most recently, he spearheaded the company's campaign to take market share away from Borland at the low end of the C market with Microsoft Quick C.

In an interview at that time, Dickerson spoke highly of Borland's strong presence in the C market. "It was a major win for them to be first to market with a product; we missed the first crack at it," he said.

As vice-president of product management at Borland, Dickerson would direct the management teams for a variety of Borland products, from its Quattro spreadsheet and Paradox data base to Turbo C and Turbo Prolog.

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HEWLETT PACKARD

Wilder

CONTINUED FROM PAGE 97

conductor manufacturing consortium Sematech. More than 30 states have formally courted the project, and last week, Massachusetts Gov. Michael Dukakis pledged a financing package worth a reported $440 million if Sematech chooses the Bay State. Another hopeful venue is Austin, Texas, where local officials have reportedly been falling all over themselves to land the consortium.

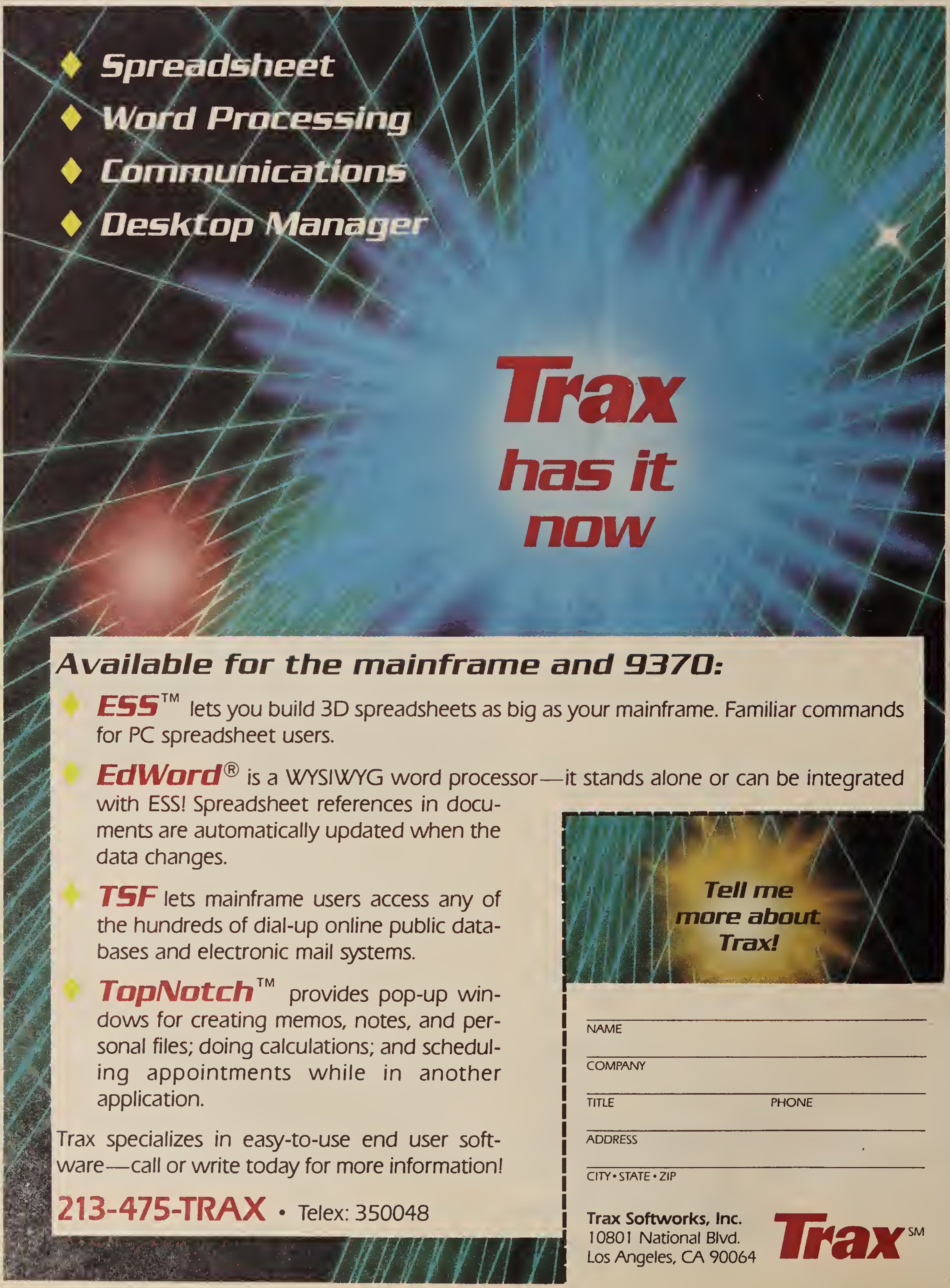
Austin obviously doesn't foresee another Microelectronics and Computer Technology Corp. scenario here. The advanced computer research center, which Austin won in a huge bidding war in 1983, has generated fewer than 1,000 jobs and has failed to draw much new high-tech business to the area, according to *Forbes* magazine.

One of life's little ironies. George Scalise was an active and vocal proponent of punitive U.S. tariffs against Japanese semiconductor dumpers when he was senior vice-president of Advanced Micro Devices. Scalise is still championing causes, but this time *against* U.S. tariffs. Scalise, now president and CEO of Maxtor, is helping lead the U.S. disk drive industry's charge against a 3.9% Customs Service tariff on products — including disk drives — manufactured offshore. A different industry means different issues and different perspectives.

Eye on Informix. Informix Software has emerged as one of the data base industry's key players to watch. Without the bravado of San Francisco Bay area neighbors Oracle and Relational Technology, Informix has quickly carved a lucrative niche for its Unix-based relational data base and is moving aggressively on other fronts.

Informix recently finalized the acquisition of Innovative Software and picked up a nice reseller deal with Wang last week. Whether coincidental or not, Informix's star really began to rise when it changed its name from Relational Database Systems, Inc. A wise move.

Wilder is *Computerworld's* senior editor, computer industry.



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Scalise

CONTINUED FROM PAGE 97

reassigned some people to help out in those areas. In doing so, we delayed the 3½-in. program. As we got back on it, we decided it might be more appropriate if we redefined the product. We've done that, and it's our intention to bring out a higher performance, higher capacity product now. We haven't given out details on how we redefined it.

What is the next big product cycle for Maxtor?
Erasable optical [disk drives] will be the next big product for us. We currently have a program in research and development and plan to bring it into production in the middle of 1988.

We have subsystems, too. We bought two companies earlier this year: U.S. Design Corp. and Storage Dimensions, Inc. In Storage Dimensions, they are largely oriented to the PC world and provide both magnetic and optical subsystems as well as the software to go along with them. U.S. Design focused more on the higher end of the spectrum, so they give us a little more range.

What are the main challenges facing this industry in 1988?
Continuing to develop and bring to market new high-capacity, better performing products is the central theme; in addition, continuing to reduce costs in existing products to make them more attractive, to prolong life cycles. Mastering optical technology and developing that market is also an important part of the future.

Maxtor and about eight other U.S. disk drive makers met during Comdex/Fall '87 to form a lobbying campaign to repeal a 3.9% U.S. Customs Service tariff on products imported from offshore. What is the status of that effort?
The customs officials have set it aside, at least temporarily. It's my feeling that it was prudent we do something about it, because if they do apply the tariff to these products coming in, it just adds 4% of cost to those products and generates no benefit to anyone. We have now put together a position paper, and our hope is we will get this resolved before the end of the year.

You still have a contract with Read-Rite, and you recently signed a one-year thin-film head component contract with Peripheral Components International. Do you have any other sources for that component now?
We have a couple of others, like TDK Corp. In addition to that, we are working vigorously on a [program to make a] ferrite head that can also be used on our 380M-byte products.

As a result of the thin-film head supply problem, Maxtor laid off 60 workers in San Jose. Is that all the staff reductions planned?
We made those adjustments reluctantly, but at that point, it wasn't clear just how rapidly we would be able to solve these problems. We also had a yield-improvement program as well as other cost-reduction plans in place. As we have continued to make progress, we are actually hiring once again and expect to do so at a moderate rate.

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Continued on page 10

BY JAMES A. MARTIN
CW STAFF

Although digital audio tape (DAT) is not available yet in the U.S. consumer marketplace, the new media is generating interest

DAT, or Data DAT (DDAT), as industry insiders call it, promises capacity of up to 1.2G bytes and storage rates of up to 10M byte/min. This represents an improvement over current standard quarter-in. tape cartridge systems with 150M-byte capaci-

BY ALAN ALPER and ELISABETH HORWITT
CW STAFF

NEW YORK — AT&T last week announced plans for a unified network management architecture that potentially would allow

The architecture is expected to evolve during the next couple of years, AT&T said. The company intends to publish initial NMP specifications within the next few months.

WOOD DALE, Ill. — A hard-disk-drive

can put the entire VS family on Ethernet."

Wang's decision to implement 802.3 on the VS acknowledges growing support for 802.3 as an industry standard as well as user demand for cost-efficient connectivity between VS systems and other vendors' computers.

tions will be designed to replace quote machines with systems that can provide client information, portfolio analysis and modeling options.

ability gets blown out ... ," said Michael Kolowich, vice-president of corporate marketing and information services

BY KATHY CHIN
CW STAFF

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Edelman lowers Telex bid

NEW YORK — Arbitrageur Asher B. Edelman has lowered his takeover bid for Telex Corp. by $10 per share, ending weeks of speculation that he faced difficulty in financing the bid at its original price.

The new $55 per-share tender offer is scheduled to expire Dec. 23, although most of Edelman's past deadlines have been extended.

Telex's board of directors was studying the lower offer last week. The Tulsa, Okla.-based maker of terminals and peripherals urged shareholders to defer any action on the new bid. Telex's own offer to shareholders is still on the table. In a move to retain current management control of the company, Telex last month proposed a recapitalization plan giving shareholders $45 per share in cash and $15 per share in 15-year bonds.

Proteon names Courtin president

WESTBORO, Mass. — Proteon, Inc. last week announced the appointment of Patrick Courtin as president, chief executive officer and a director of the company.

Investor L. J. Sevin, who had been serving as acting president and CEO, will continue with Proteon as chairman of the executive committee and as a director.

Proteon has been without a full-time president since March, when then-president Francis Scricco resigned.

Courtin brings 20 years of networking and telecommunications experience to Proteon. Most recently, he was senior vice-president of strategic marketing and technology with TIE/Communications, Inc., a manufacturer of data private branch exchange and telecommunications products in Shelton, Conn.

Prior to that, Courtin was with Digital Equipment Corp. for 10 years, where he was senior group manager for networks and communications with responsibility for all of DEC's communications products.

Before joining DEC, Courtin was a senior consultant for several years with Metra International-SEMA in Paris. There he worked principally as a network architect for the French/3 network.

Patrick Courtin

White knight

FROM PAGE 97

tries, matched the investor group's $8.75 offer [CW, Nov. 30]. An Econocom spokeswoman said the firm would consider increasing its offer, which expires Dec. 10, if the requested Decision Industries financial information justifies a higher share valuation. Econocom holds 23% of Decision Industries' 9.4 million outstanding shares.

Econocom made an $11-per-share offer for Decision Industries' outstanding shares last October but reduced its bid in the aftermath of October's stock market crash.

The investment group, which has already signed a definitive agreement to acquire Decision Industries, has formed a shell company — Onset Corp. — to manage the tender offer. Decision Industries, the parent of IBM System/36 peripherals maker Decision Data Computer Corp., will be merged into Onset if a majority of Decision Industries outstanding shares are tendered.

Onset's tender offer, which expires Dec. 29., is also contingent on the investor group's ability to obtain a three-year, $50 million revolving credit line. The group is principally backed by New York venture capital firms J. H. Whitney & Co. and Welsh, Carson, Anderson & Stowe.

Joel Sussman, Decision Industries' vice-president of finance, said the firm opted for Onset's offer — after seeking bids from a variety of unidentified parties — because it includes a fully negotiated acquisition agreement and protects all shareholders, whether or not they tender their shares to Onset.

Econocom's $8.75-per-share proposal, he said, appears to be contingent on receipt of financial data certifying Decision Industries' share value.

"We've offered them that information for the last month, and it's only after the Onset offer that they said they wanted it," Sussman said.

Whitney and Welsh, Carson, Anderson & Stowe have been actively involved in leveraged buy-outs of computer industry companies in the last two years. The two firms orchestrated the leveraged buy-outs of Genicom Corp. from General Electric Co. and Momentum Technologies, Inc., formed from the majority of the assets of the former Mohawk Data Sciences Corp. (now Qantel Corp.)

The investors attempted to merge Genicom with Momentum last year, but abandoned their efforts after they could not gain the backing of Genicom's lenders [CW, June 22]. At that time, Whitney general parter Don Ackerman, who is chairman of both Genicom and Momentum, said the investment group would seek another merger partner for Genicom as well as a recently concluded acquisition of Centronics Data Corp.

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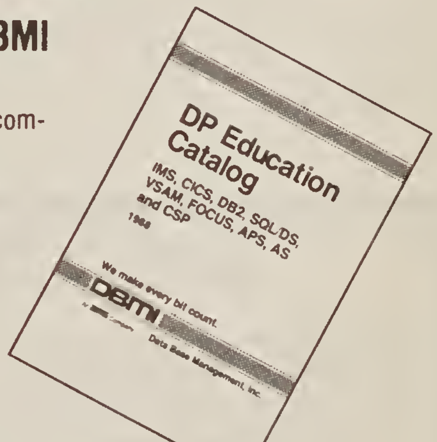
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CW8712

New systems redefine DBA field

Relational technology is creating fresh openings for data base experts

BY SHERYL KAY
SPECIAL TO CW

The marriage of traditional data base approaches with relational technology is creating new opportunities for experienced data base administrators (DBA) as well as up-and-coming professionals.

"Today's DBA position has aspects of technical and managerial skills," says Nancy McDonald, president of Computer Technology Planning, Inc. in Tampa, Fla. "There are more rungs on the ladder with new, higher levels for a DBA to strive for."

Prior to the advent of relational technology, the administrator was in charge of a hierarchical data base that required someone with deep technical expertise. Often these hierarchical administrators rose through the ranks from systems programming. "The hierarchical DBAs were more background individuals who looked at charts," says Tom Green, director of computer services for Price Waterhouse.

With relational technology, the entire data administration group's function is moving toward addressing multiuser access. "Getting the information to management in a timely fashion is the thrust today," says Tom Trimmer, president of Quest Management Systems in Birmingham, Mich. "The dynamic, ad hoc approach causes the DBA group to work a bit differently. The emphasis is on speed of retrieval for the executive suite."

A new look

As the responsibilities of the DBA evolve, the profile of those who make up the team change. "All of MIS is turning back to the user," says Dave Wilson, data base manager for Price Waterhouse. "Therefore, the effort of the DBA group is to put data back into the hands of the user. The person you will find now in the DBA group is more of a designer and an applications person dealing with end users."

In short, technical skills are still required, but now data administrators also need the skills necessary for dealing with users. Two years ago, as it began to devote more of its data base development to relational data base management systems, American Express Co. changed the profile of its DBAs.

"Typically, we looked for people with good systems development or technical support backgrounds," says Tomas Stack, manager of data management. "We still do, but back in 1985 we began to bring people into our data analysis group from internal business areas such as customer service or credit analysis. We put them into classes to teach them design techniques, but we wanted people who knew our business. We are looking for more analysis background and less of the technical guru."

> "KNOCK ON YOUR manager's door and say, 'I want to get into data management.' . . . We need more people interested in becoming DBAs."
>
> TOM GREEN
> PRICE WATERHOUSE

But professionals with both analytical and technical backgrounds in relational technology are hard to find. "There's a definite shortage of people with relational backgrounds," Stack says. "Companies moved slowly toward the technology, wanting to make sure the product is proven."

The shortage is also partially because most shops have only one DBA, so the pool of candidates is very small to begin with.

Titles for members of a data base administration group vary, generally depending on the overall size of the MIS staff. A small department may hire only one DBA, who does everything. A large shop may split the design functions, with data analysts handling the logical design (also called data modelers or data engineers), data base analysts responsible for the physical design and a DBA who oversees both logical and physical designs.

Candidates with two years of DBA experience can expect a salary of $35,000 to $42,000. Salaries are about 15% to 20% lower in southern states. Four to six years of experience in data base administration will command a salary of $42,000 to $50,000, and the salaries for more than seven years of experience exceed $50,000.

With the characteristics of relational technology leaning heavily toward the users in a company, the number of DBA positions will continue to grow. The actual design methodology of relational technology is generally less complex than hierarchical and, therefore, for a specific application fewer DBA hours may be required.

Overall, however, the number of opportunities in data administration will be greater because of the emphasis on data access.

Says McDonald, "The fine edge of competitiveness depends on a manager at Company A getting one piece of information a few minutes before the manager at Company B gets that same information. A relational DBMS gives executives this ability and once they have it, there will be more requests for information, therefore creating more jobs for DBAs."

Make things happen

Not all who aspire to be part of the data administration team can obtain exposure to relational technology even if their current employer uses DBMSs in-house. For such individuals, there are still many avenues to investigate to become relational data base administrators.

"Knock on your manager's door and say, 'I want to get into data management,' " says Price Waterhouse's Green. "With the flexibility of the new technology, and the increase in user requests because of this technology, we need more people interested in becoming DBAs."

Wilson recommends learning one of the fourth-generation languages that are associated with a relational DBMS, thereby becoming more acquainted with the technology.

Kay is a Tampa, Fla.-based free-lance writer.

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A flagship public benefit corporation seeks several MIS pros to fill newly created positions. We are a small dedicated group that appreciates innovative, motivated persons who would complement our current staff.

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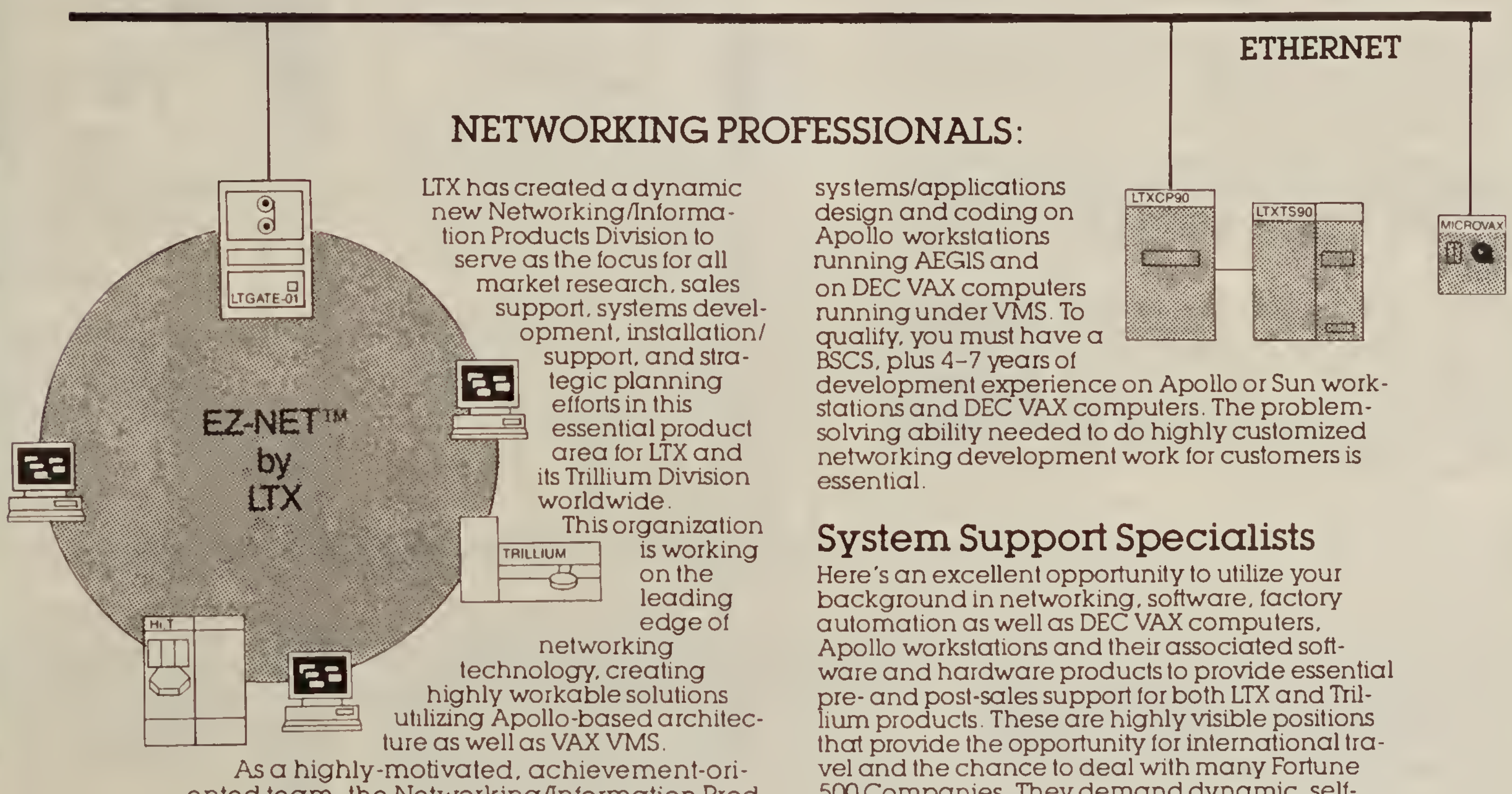

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You will perform data analysis, modeling and normalization activities in support of a three-schema, data driven approach to application systems development. You will also develop logical and physical data structures, supervise test and production data base maintenance and support activities, provide for data base performance analysis and tuning activities. Develop data base related standards and procedures.

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[1] Levering, Moskowitz and Katz, *The 100 Best Companies To Work For In America*. © 1987, by New American Library, reprinted by arrangements with Addison-Wesley Pub Co Inc., Reading, MA 01867

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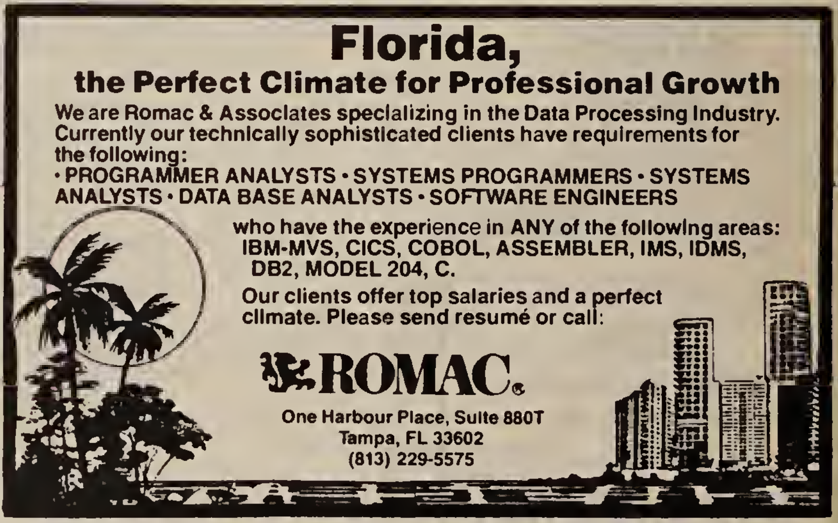

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Provides project leadership for financial and cost accounting, order processing, distribution and point of sale systems. An in-depth knowledge of data base, data communications, and on-line processing concepts required. IBM mainframe background and familiarity with CICS is desirable. A Bachelor's degree and at least 5 to 7 years of computer information systems experience required. An MBA is desirable

SR. PROGRAMMER/ANALYSTS

Positions will involve the development of financial, manufacturing, distribution and sales applications. Requirements include a Bachelor's degree and a minimum of 2 to 4 years experience with COBOL TSO/JCL in an IBM mainframe environment in a manufacturing company. Experience with CICS, IDMS and exposure to PIOS is a plus.

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- Positions require UNIX* background. UNIX* V internals would be a plus. Must also have experience in compiler development, compiler support or software product porting in the UNIX* V environment. Also requires software quality assurance experience for UNIX* based software products.

UNIX* (Operating Systems)

Positions require strong background in UNIX* operating systems, and "C" language is necessary. Product development experience is desirable. UNIX* internals experience is also helpful.

UNIX* (Data Communications)

Positions require background in UNIX* and "C" and a knowledge of device drivers. Must have experience in one or more of the following areas: async/sync host communications (e.g. IBM, Sperry, Burroughs); LAN's, Wide Area Networks (PDN/ DDN) including protocols such as TP-4, TCP/IP, or ISO/OSI standards.

UNIX* (Relational Database)

Positions require 1 to 3 years experience with Relational Database management software running under the UNIX* operating system (e.g. Oracle, Ingres, Unify, or Informex).

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Positions require BS/MS Computer Science or equivalent education, training and/or experience plus five years of related work experience. Knowledge of MS-DOS, C language and communications protocol development desirable (e.g. TCP/IP protocols, LAN interface or OSI Transport). Will design, code, test and document communications software running on MS-DOS or Unisys DCP/Telcon network systems.

For consideration, send your resume in confidence, indicating your area of interest to: **UNISYS Corporation, Attn: Ms. Lynne Tibolla, Employment Dept. 1a, Bldg. C, 322 North 2200 West, Salt Lake City, Utah 84116.**

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The positions listed below are within the Child Support Enforcement System (CSES) Project of the Michigan State Court Administrative Office

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Supervises daily operations of the central site data center as well as coordinates activities within the CSES remote computer installations. Bachelor's in computer science or related field. Six years of data processing operations experience with at least one of those years in a supervisory or management capacity in a mid-sized computer center. Experience with DEC equipment, VMS, and a distributed processing environment preferred as well as knowledge of IBM and other mid-size systems. Low $30's to mid $40's.

DATA NETWORK SUPERVISOR

Participates in the design, implementation, and maintenance of a state-wide data communications network for the CSES project. Bachelor's in computer science or related field or technical certification. Four years of systems analysis experience, including recent experience developing and implementing local area networks. One year of supervisory experience. Exposure to wide-area packet-switched networks is desirable. Knowledge of DECNET, X.25, and Ethernet technology is preferred. Low $30's to low $40's

SYSTEMS SUPERVISOR

Supervises the development and implementation of the CSES applications software, and after system implementation, supervises systems maintenance services and support. Bachelor's in computer science or related field Six years of progressively responsible experience in programming and analysis with applications using databases, including two years of supervisory experience in a multiuser environment Experience with fourth generation languages and relational databases is required Experience with mid-range computers as well as PC's is desirable, experience with DEC equipment, VMS software, and Cortex Application Factory is preferred. Mid $30's to mid $40's

Positions located in Lansing, Michigan. Possession of a valid motor vehicle operator's license is required Some in-state travel Submit resume to Personnel Department, State Court Administrative Office, P.O. Box 30048, Lansing, MI 48909 no later than December 23, 1987 EOE

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SYSTEM 38 PROGRAMMER/ ANALYST

Pennsylvania Pressed Metals, Inc. is seeking a programmer/analyst with 2+ years of RPG III experience. Structured programming, systems design, and online programming experience is required. Additional experience with microcomputers or RMS software is a definite plus.

We are a progressive manufacturer of powder metal products looking for the right person to provide the technical leadership needed to further advance our System/38. We offer a competitive salary/benefit package and opportunity for professional growth. Principals only need apply. Send resume and salary history to:

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CAD SUPPORT SOFTWARE ENGINEER

Motorola, Inc., a Fortune 100 Corporation and a world leader in innovative communication products, is seeking an individual with a minimum of 2 years experience in the areas of CAD programming for our Portable Products Division located in Ft. Lauderdale, Florida.

The position provides the opportunity to develop software that will enhance the effectiveness of the Design and Engineering organizations that use CAD systems. The individual will also help implement the transfer of product design data into Production Operations, and develop software that improves CAD system administration functions.

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Motorola provides an excellent salary and benefits including relocation assistance. For immediate consideration, send your resume and salary history to: **Staffing Manager, MOTOROLA, INC., 8000 W. Sunrise Blvd., Plantation, FL 33322, Attn: JZ.** We are an equal opportunity/affirmative action employer.

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Data Processing

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IBM System 38: RPG III (with or without MAPICS -- A/P)
DEC VAX: VMS, COBOL, RALLY (A/P); DCL, CRESTA (Project Leader).
UNIVAC 1100: MAPPER, COBOL, DMS, DPS (A/P).
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1-800-422-5616 (outside N.Y. State)
(212) 355-7760 (inside N.Y. State)
Attn: Bruce Merry
or Bob Santangelo

TEXAS 100 Decker Court, Suite 280, Irving, TX 75062
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Applications accepted until position is lilled, salary and starting date negotiable. Send application to Personnel Director, Franklin College, Franklin, Indiana 46131

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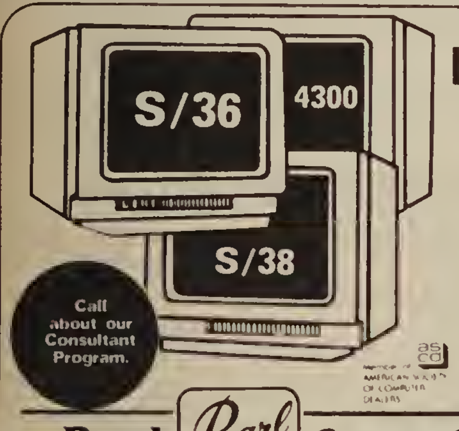
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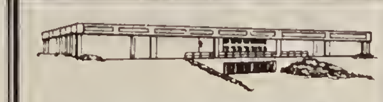

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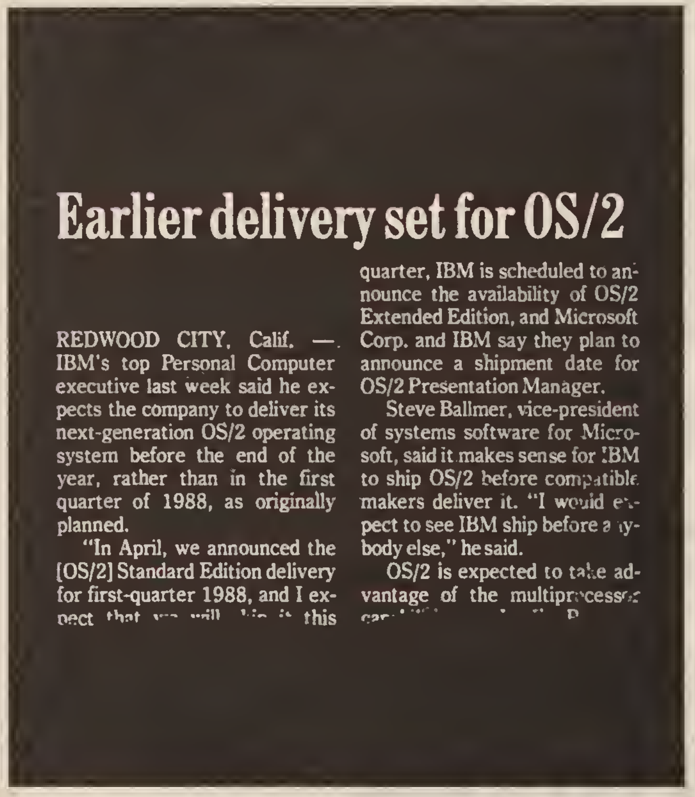


Earlier delivery set for OS/2

REDWOOD CITY, Calif. — IBM's top Personal Computer executive last week said he expects the company to deliver its next-generation OS/2 operating system before the end of the year, rather than in the first quarter of 1988, as originally planned.

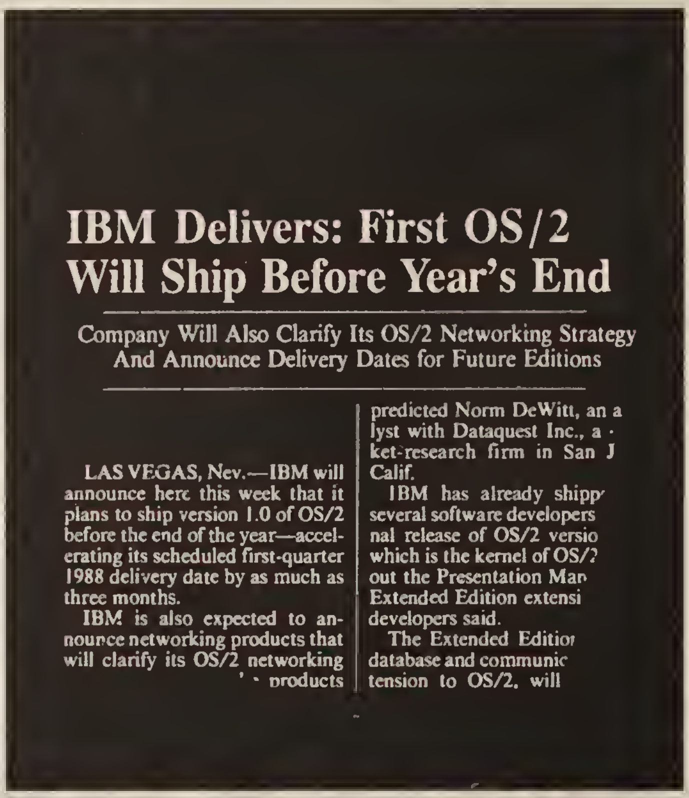
"In April, we announced the [OS/2] Standard Edition delivery for first-quarter 1988, and I expect that [illegible] this quarter, IBM is scheduled to announce the availability of OS/2 Extended Edition, and Microsoft Corp. and IBM say they plan to announce a shipment date for OS/2 Presentation Manager.

Steve Ballmer, vice-president of systems software for Microsoft, said it makes sense for IBM to ship OS/2 before compatible makers deliver it. "I would expect to see IBM ship before anybody else," he said.

OS/2 is expected to take advantage of the multiprocessor [illegible]

October 26, 1987

PC Week:



IBM Delivers: First OS/2 Will Ship Before Year's End

Company Will Also Clarify Its OS/2 Networking Strategy And Announce Delivery Dates for Future Editions

LAS VEGAS, Nev.—IBM will announce here this week that it plans to ship version 1.0 of OS/2 before the end of the year—accelerating its scheduled first-quarter 1988 delivery date by as much as three months.

IBM is also expected to announce networking products that will clarify its OS/2 networking [illegible] products

predicted Norm DeWitt, an a
lyst with Dataquest Inc., a
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IBM has already shipp
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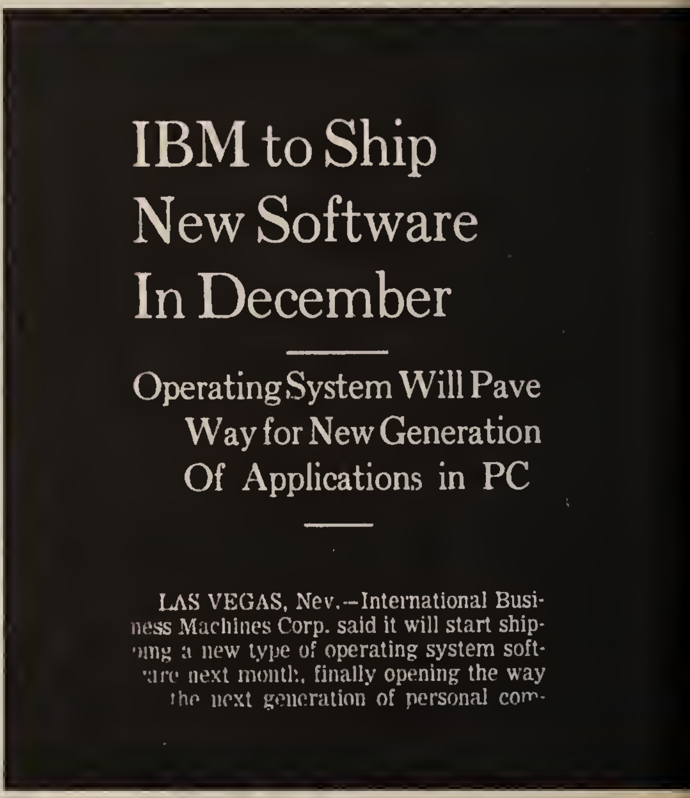
November 3, 1987

Wall Street Journal:



IBM to Ship New Software In December

Operating System Will Pave Way for New Generation Of Applications in PC

LAS VEGAS, Nev.—International Business Machines Corp. said it will start shipping a new type of operating system software next month, finally opening the way the next generation of personal com-

November 4, 1987

Because you can't wait.

COMPUTERWORLD

An IDG Communications Publication

COMPUTERWORLD

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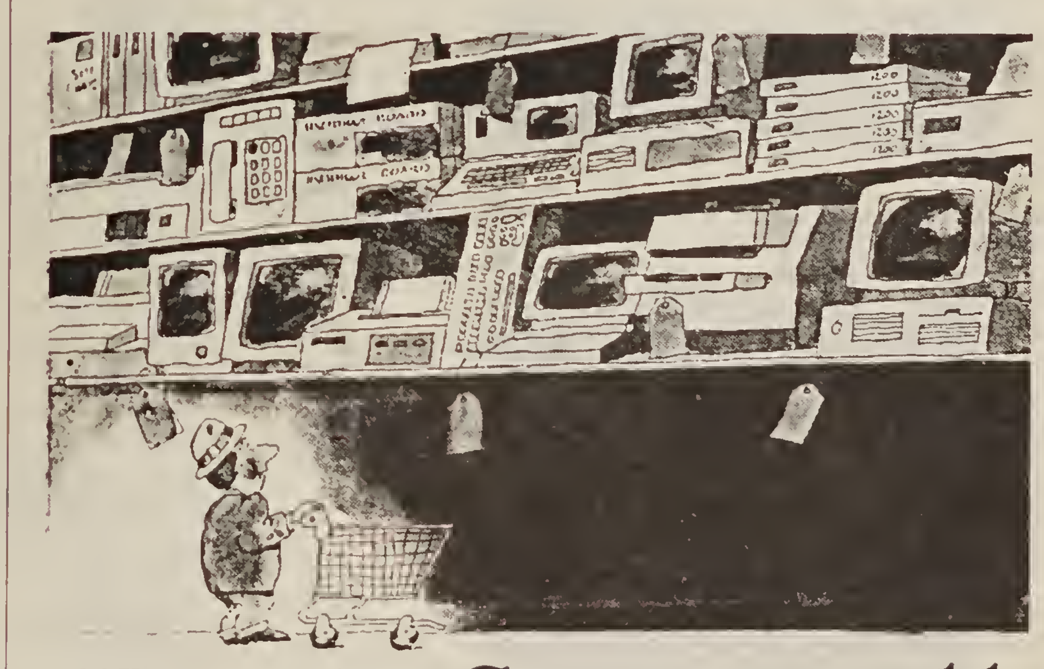

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Feb. 8	DEC-Compatible Software	Jan. 21
Feb. 29	Performance Management/ Capacity Planning	Feb. 12
March 14	DBMS	Feb. 26
March 28	Micro-to-Host-Links	March 11
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April 25	TBA	April 8
May 9	Printers	April 22
May 23	Data Communications	May 6

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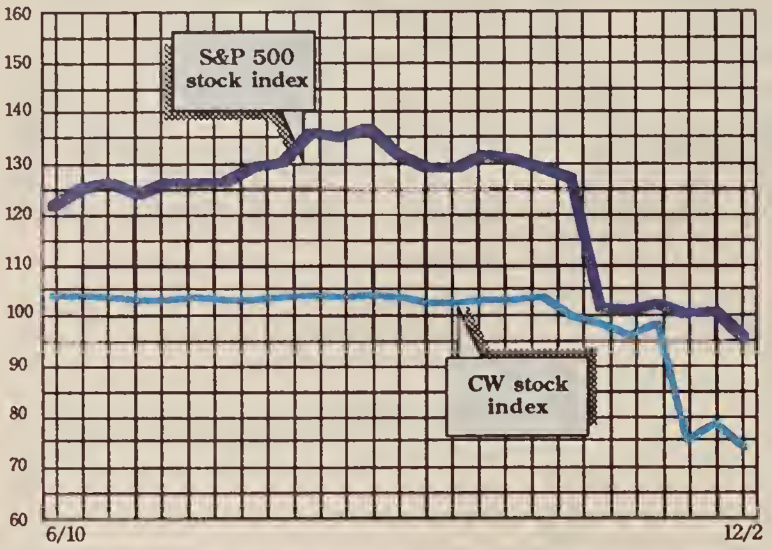

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Computer Systems	85.6	**79.1**
Software & DP Services	92.5	**89.2**
Semiconductors	53.5	**49.0**
Peripherals & Subsystems	71.6	**68.2**
Leasing Companies	90.7	**83.6**
Composite Index	78.8	**74.0**
S&P 500 Index	100.5	**95.2**

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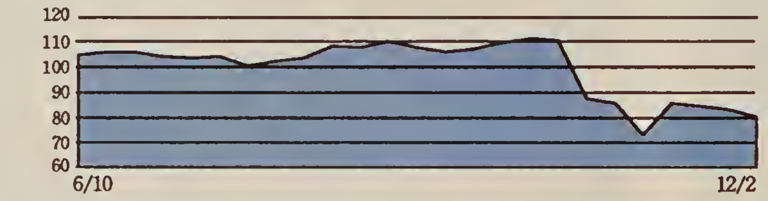
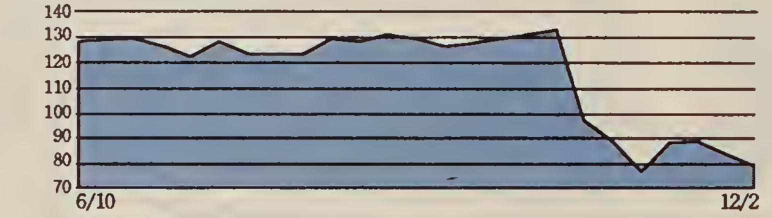


Computer Systems



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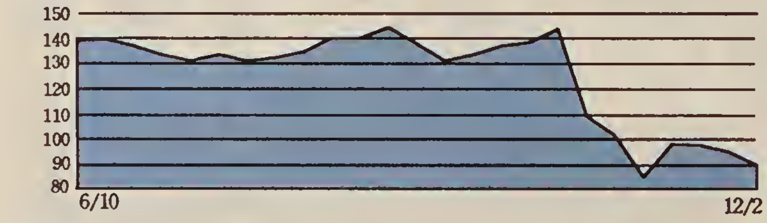

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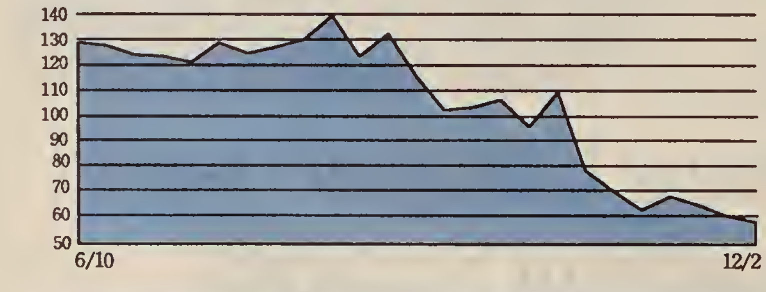

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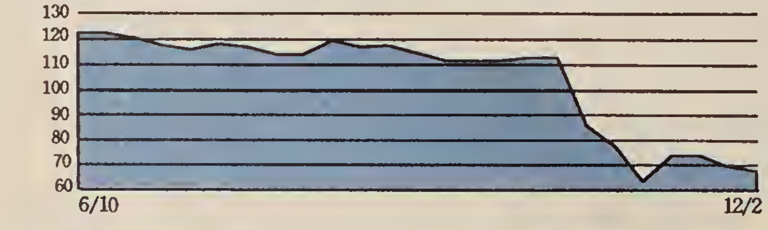
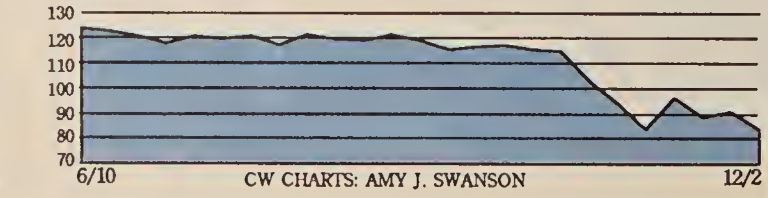


Leasing Companies



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CLOSING PRICES WEDNESDAY, DECEMBER 2, 1987

Communications and Network Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE DEC. 2 1987	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	100	74	83.75	-2.25	-2.62
Q	ANDREW CORP	19	11	11.25	0.00	0.00
Q	ARTEL COMM CORP	5	2	2.00	0.25	14.29
N	AT&T	36	20	27.13	-1.50	-5.24
Q	AVANT GARDE COMP INC	6	2	2.00	-0.38	-15.79
Q	AVANTEK INC	19	7	8.00	-0.13	-1.54
N	AYDIN CORP	38	16	19.38	-0.63	-3.13
N	BELL ATLANTIC CORP	80	61	66.75	-2.13	-3.09
N	BELLSOUTH CORP	44	29	36.75	-1.50	-3.92
Q	FIBRONICS INT	28	12	14.00	-1.25	-8.20
Q	COMPRESSION LABS INC	8	2	2.75	-0.38	-12.00
O	COMPUTER NETWORK TECH	6	2	2.69	-0.13	-4.44
O	CONTEL CORP	40	25	28.50	-0.50	-1.72
Q	DATA SWITCH CORP	9	4	4.63	-0.25	-5.13
Q	DIGITAL COMM ASSOC	49	20	23.63	-0.88	-3.57
Q	DYNATECH CORP	44	14	18.75	-1.00	-5.06
Q	EQUATORIAL COMM CO	5	2	3.38	0.06	1.87
Q	GANDALF TECHNOLOGIES	11	5	5.88	-0.44	-6.94
Q	GENERAL DATACOMM INDS	14	3	4.75	-0.13	-2.56
N	GTE CORP	45	29	36.13	-1.25	-3.34
Q	INFOTRON SYS CORP	12	5	5.25	-0.50	-8.70
N	ITT CORP	66	44	44.75	-2.25	-4.79
N	M A COM INC	16	7	8.63	-0.50	-5.48
Q	MCI COMMUNICATIONS CORP	12	5	9.50	-0.25	-2.56
Q	MICOM SYS INC	18	7	7.13	0.25	3.64
Q	NETWORK SYS CORP	19	7	7.25	-0.88	-10.77
N	NORTHERN TELECOM LTD	24	14	16.25	-0.25	-1.52
Q	NOVELL INC	30	12	18.25	-1.75	-8.75
N	NYNEX CORP	78	58	66.88	-1.88	-2.73
N	PACIFIC TELESIS GROUP	34	9	27.38	-0.25	-0.90
N	PARADYNE CORP	9	4	3.75	-0.13	-3.23
A	PENRIL CORP	6	1	2.25	0.13	5.88
N	PLESSEY PLC	41	23	23.50	-2.00	-7.84
N	SCIENTIFIC ATLANTA INC	20	8	10.38	-1.00	-8.79
N	SOUTHWESTERN BELL CORP	46	22	34.75	-1.50	-4.14
Q	3 COM CORP	26	12	16.75	-0.63	-3.60
N	TIMEPLEX INC	41	17	28.63	-1.63	-5.37
Q	UNGERMANN 8ASS INC	16	6	6.50	-0.75	-10.34
N	U S WEST INC	60	43	49.38	-1.13	-2.23

Computer Systems

EXCH		52-WEEK RANGE (1)		PRICE CLOSE DEC. 2 1987	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLIANT CDMPUTER SYS	37	5	6.00	-0.50	-7.69
Q	ALPHA MICROSYSTEMS	6	3	3.13	-0.63	-16.67
Q	ALTOS COMPUTER SYS	17	9	9.75	-0.75	-7.14
A	AMDAHL CORP	50	19	27.88	-3.50	-11.16
Q	APOLLO COMPUTER INC	25	9	11.00	-0.63	-5.38
Q	APPLE COMPUTER INC	60	20	32.50	-4.50	-12.16
N	BOLT BERANEK & NEWMAN	30	12	14.50	-0.13	-0.85
Q	8RITTON LEE INC	5	1	1.50	-0.13	-7.69
N	COMPAQ COMPUTER CORP	79	19	43.50	-6.38	-12.78
Q	COMPUTER AUTOMATION INC	17	3	6.75	-1.50	-18.18
A	COMPUTER CONSOLES INC	12	2	3.13	-0.25	-7.41
Q	CONCURRENT COMP CORP	24	11	16.00	0.75	4.92
N	CONTROL DATA CORP DEL	38	18	22.00	-1.25	-5.38
Q	CONVERGENT TECH	12	3	3.00	0.13	4.35
Q	CONVEX COMPUTER CORP	22	6	6.75	-1.13	-14.29
N	CRAY RESH INC	136	47	65.63	-3.63	-5.23
Q	DAISY SYS CORP	13	5	6.25	-0.38	-5.66
N	DATA GEN CORP	39	16	20.38	-1.00	-4.68
N	DATAPOINT CORP	9	3	4.75	-0.50	-9.52
N	DIGITAL EQUIP CORP	200	105	121.00	-7.25	-5.65
N	FLOATING POINT SYS INC	17	3	3.25	-0.63	-16.13
N	GOULD INC	34	8	11.00	-0.50	-4.35
N	HARRIS CORP	43	24	24.38	-0.75	-2.99
N	HEWLETT PACKARD CO	74	36	47.63	-4.38	-8.41
N	HONEYWELL INC	91	49	55.25	-2.25	-3.91
N	IBM	176	102	110.50	-8.00	-6.75
Q	INFORMATION INTL INC	17	9	9.75	0.00	0.00
Q	IPL SYS INC	3	2	2.38	0.00	0.00
Q	MASS COMPUTER CORP	14	5	5.13	-2.13	-29.31
N	MATSUSHITA ELEC INDL LTD	196	93	161.00	-6.50	-3.88
Q	MEGADATA CORP	7	3	3.25	0.13	4.00
Q	MENTOR GRAPHICS CORP	39	14	17.00	-0.25	-1.45
N	N8I INC	14	4	3.88	-0.88	-18.42
N	NCR CORP	87	44	63.50	-0.75	-1.17
N	PRIME COMPUTER INC	31	12	13.50	-0.38	-2.70
Q	PYRAMID TECHNOLOGY	12	4	6.00	0.00	0.00
Q	STRATUS COMPUTER	41	15	19.00	-2.75	-12.64
Q	SUN MICROSYSTEM INC	46	14	27.38	-3.13	-10.25
Q	SYMBOLICS INC	6	1	1.19	-0.38	-23.99
N	TANDEM COMPUTERS INC	38	17	22.38	-1.25	-5.29
N	TANDY CORP	57	29	30.88	-4.50	-12.72
N	ULTIMATE CORP	37	16	18.63	-1.88	-9.15
N	UNISYS CORP	48	24	29.63	-1.88	-5.95
A	WANG LABS INC	19	10	10.38	-0.75	-6.74

Software & DP Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE DEC. 2 1987	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ADVANCED COMP TECH	6	3	3.50	0.38	12.00
N	ADVANCED SYS INC	35	16	27.00	2.75	11.34
N	AGS COMPUTERS INC	30	11	13.50	-2.00	-12.90
Q	AMERICAN MGMT SYS INC	20	9	10.63	-1.00	-8.60
Q	AMERICAN SDFTWARE INC	22	6	7.88	-0.63	-7.35
N	ANACDMP INC	11	4	5.13	-0.38	-6.82
Q	ANALYSTS INTL CORP	10	4	6.25	0.00	0.00
Q	ASHTON TATE	33	13	16.63	-2.13	-11.33
Q	ASK COMPUTER SYS INC	17	6	7.50	-0.88	-10.45
Q	AUTODESK INC	34	12	17.75	0.25	1.43
N	AUTO DATA PROCESSING	55	16	39.75	-4.00	-9.14
Q	BOOLE & 8ABBAGE INC	12	5	6.75	0.25	3.85
N	COMPUTER ASSOC INTL INC	37	13	24.38	-1.25	-4.88
Q	COMPUTER HORIZONS CORP	15	8	8.63	-0.13	-1.43
N	COMPUTER SCIENCES CORP	73	40	45.75	-3.50	-7.11
N	COMPUTER TASK GROUP INC	1B	9	10.75	0.63	6.17
Q	COMSHARE INC	28	12	13.00	0.00	0.00
N	CULLINET SDFTWARE INC	14	5	5.25	-0.88	-14.29
Q	CYCARE SYS INC	10	6	6.13	0.13	2.08
Q	DUQUESNE SYS INC	33	10	15.50	0.50	3.33
A	DATA ARCHITECTS, INC.	17	7	7.88	0.38	5.00
N	GENERAL MTRS (CLS E)	51	24	33.50	-1.25	-3.60
Q	HOGAN SYS INC	17	5	5.50	-0.25	-4.35
Q	INFDRMIX CORP	31	10	18.50	-0.50	-2.63
Q	INTELLICORP INC	11	3	3.25	-0.50	-13.33
Q	KEANE INC	10	5	6.25	0.25	4.17
Q	LOTUS DEV CORP	40	16	24.25	-2.00	-7.62
Q	MANAGEMENT SCI AMER	21	6	6.50	-0.38	-5.45
Q	MICRO PRD INTL CORP	8	2	3.81	-0.25	-6.15
Q	MICROSOFT CORP	79	23	44.00	-3.50	-7.37
Q	NATIONAL DATA CORP	34	19	21.50	-0.5D	-2.27
Q	ON LINE SOFTWARE INTL INC	22	9	9.88	0.38	3.95
Q	ORACLE SYS CORP	38	9	21.13	-0.88	-3.98
N	PANSOPHIC SYS INC	28	11	13.25	-0.63	-4.50
Q	POLICY MGMT SYS CORP	30	15	18.50	0.50	2.78
Q	PROGRAMMING & SYS INC	14	7	7.63	-0.25	-3.17
Q	REYNDLDS & REYNOLDS CO	39	14	15.75	-0.25	-1.56
Q	SEI CORP	18	9	13.75	0.25	1.85
Q	SHARED MED SYS CORP	53	19	21.00	-0.38	-1.75
Q	SOFTWARE AG SYSTEMS INC	19	9	9.38	-0.25	-2.60
Q	SOFTWARE PUBG CORP	17	5	6.63	-0.38	-5.36
A	STERLING SOFTWARE INC	14	6	7.25	-0.88	-10.77
Q	SUNGARD DATA SYS INC	21	10	10.50	-0.63	-5.62
Q	SYSTEMATICS INC	30	17	21.50	-3.00	-12.24
N	SYS. SOFT INC.	24	7	9	-1.00	-10.26
N	URS CORP	23	11	11.00	0.00	0.00
Q	VM SOFTWARE INC	45	7	7.50	-1.50	-16.67

Semiconductors

EXCH		52-WEEK RANGE (1)		PRICE CLOSE DEC. 2 1987	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	25	8	8.63	-1.38	-13.75
N	ANALOG DEVICES INC	24	9	9.63	-0.38	-3.75
Q	ANALOGIC CORP	13	6	6.00	-1.50	-20.00
Q	INTEL CORP	42	14	22.50	-1.50	-6.25
Q	LSI LOGIC CORP	17	7	7.00	-0.75	-9.68
N	MOTOROLA INC	74	35	42.13	-2.63	-5.87
N	NATL SEMICONDUCTOR	22	10	11.50	-1.00	-8.00
N	TEXAS INSTRS INC	80	36	41.88	-3.00	-6.69
A	WESTERN DIGITAL CORP	33	12	13.13	-0.13	-0.94

Peripherals

EXCH		52-WEEK RANGE (1)		PRICE CLOSE DEC. 2 1987	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLOY COMP.	12.75	4.5	5.75	-1.00	-14.81
N	AM INTL INC	9	3	5.13	0.50	10.81
Q	AST RESH INC	23	6	7.00	-0.25	-3.45
Q	AUTO TROL TECH CORP	9	3	3.75	-0.25	-6.25
Q	BANCTEC INC	16	6	6.13	-0.13	-2.00
Q	CIPHER DATA PRODS INC	18	4	6.00	0.38	6.67
A	COGNITRONICS CORP	5	2	2.50	0.00	0.00
N	COMPUGRAPHIC CORP	28	19	19.00	-1.75	-8.43
N	COMPUTERVISION CORP	23	7	7.88	-0.38	-4.55
A	DATAPRODUCTS CORP	24	7	7.88	0.00	0.00
A	DATARAM CORP	9	5	5.13	-1.25	-19.61
N	DECISION INDS CORP	13	4	9.00	0.38	4.35
N	EASTMAN KODAK CO	71	42	45.75	-2.38	-4.94
Q	E M C CORP MASS	29	10	11.75	-2.25	-16.07
Q	EMULEX CORP	10	4	4.31	-0.19	-4.16
Q	EVANS & SUTHERLAND	40	18	19.00	-1.50	-7.32
Q	ICOT CORP	13	3	4.00	0.00	0.00
Q	INTERLEAF INC	24	9	13.38	-1.50	-10.08
Q	IOMEGA CORP	8	1	1.38	-D.25	-15.38
Q	LEE DATA CORP	10	3	3.00	-0.13	-4.00
Q	MASSTOR SYS CORP	6	1	1.56	-0.19	-10.69
Q	MAXTOR CORP	34	6	8.00	-0.50	-5.88
Q	MICROPOLIS CORP	44	13	18.00	-0.50	-2.70
Q	MINISCRIBE CORP	18	5	6.25	-0.63	-9.09
N	MINNESOTA MNG & MFG CO	84	45	58.75	-5.50	-8.56
A	MSI DATA CORP	24	11	14.13	-1.13	-7.38
Q	PRIAM CORP	6	1	1.38	-0.19	-12.03
Q	PRINTRONIX INC	13	8	7.50	-0.50	-6.25
N	QMS INC	27	11	11.88	-2.00	-14.41
Q	QUANTUM CORP	35	8	9.63	-0.13	-1.28
Q	RAMTEK CORP	6	2	3.38	0.13	3.85
N	RECOGNITION EQUIP INC	27	7	8.50	0.13	1.49
Q	REXON INC	14	5	5.00	-0.13	-2.44
Q	SCAN TRON CORP	17	7	9.25	-0.25	-2.63
Q	SEAGATE TECHNOLOGY	46	10	13.38	0.88	7.00
N	STORAGE TECH CORP	5	1	1.38	0.13	10.00
Q	TANDON CORP	7	2	1.75	-0.19	-9.70
A	TEC INC	7	3	4.25	0.00	0.00
N	TEKTRONIX INC	43	23	24.25	-2.13	-8.06
Q	TELEVIDEO SYS INC	3	1	1.13	-0.19	-14.32
N	TELEX CORP	102	30	45.75	-3.25	-6.63
Q	WYSE TECH	40	11	15.38	-3.13	-16.89
N	XEROX CORP	85	50	52.00	-4.50	-7.96
Q	XIDEX CORP	16	6	6.50	0.25	4.00

Leasing Companies

EXCH		52-WEEK RANGE (1)		PRICE CLOSE DEC. 2 1987	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	CAPITAL ASSOCIATES INTERNATIONAL, INC.	11	4	4.00	0.00	0.00
N	COMDISCO INC	37	12	16.25	-0.88	-5.11
N	CONTINENTAL INFO SYS	14	6	5.88	-0.75	-11.32
Q	PHOENIX AMERN INC	8	3	3.00	0.00	0.00
Q	SELECTERM INC	6	3	3.00	-0.88	-22.58

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL;
O = OVER-THE-COUNTER; S = SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST 8ID
(1) TO NEAREST DOLLAR

One giant thud

Big Blue suffers big loss as market dives; DEC burned, too

The bigger they are, the harder they fall. And when the Dow Jones industrial average suffers two daily drops of more than 70 points in one week, IBM is sure to fall far.

Such was the case last week, as Big Blue took an 8⅜-point beating in four days to close Thursday at 106½, not far from its 52-week low of 102 in the days following Black Monday. IBM's misery had plenty of company, however, as Digital Equipment Corp. lost 9 points to 116½ and Compaq Computer Corp. sank 5 points to 41.

Other leading systems vendors fared slightly better, but many were trading near new lows. Control Data Corp. was down 2¼ to 21, Unisys Corp. lost 3 to 27⅞, Data General Corp. slipped 1⅜ to 19½, Prime Computer, Inc. lost half a point to 13⅛ and NCR Corp. was off 1½ to 62. Stocks hitting new lows Thursday included Cullinet Software, Inc., at 4¾, and Harris Corp., at 23.

Big over-the-counter victims included Apple Computer, Inc., down 4½ to 30½, and Apollo Computer, Inc., down 2⅝, or 21%, to 10. Microsoft Corp. fell 4⅞ to 40⅜, Lotus Development Corp. was down 3 to 26 and Ashton-Tate Corp. dropped 2¼ to 15½.

CLINTON WILDER

IBM steps into ISDN corner

BY ELISABETH HORWITT
CW STAFF

IBM spokesmen last week affirmed the vendor's commitment to Integrated Services Digital Network (ISDN) and, at the same time, warned that cost savings are a prerequisite for early user adoption of the standard.

Customers have told IBM that lower cost is at the top of their ISDN priority list, according to P. W. Terrell, IBM's ISDN systems manager. Second is greater flexibility and vendor independence in the implementation and attachment of different devices to various networking equipment and services. Voice/data integration is third.

"The tariff structure will affect ISDN acceptance; customers will look for ways to lower cost, at least initially," Terrell said.

"If users don't get lower costs and more for their money, they won't be interested [in ISDN]," said W. Edward Hodgson, computer and communications manager for Westinghouse Electric Corp. "Our users want 100% network availability and guaranteed response time 24 hours a day at no greater cost."

Westinghouse hopes ISDN will make affordable the advantages of digital over analog connections, such as more sophisticated diagnostics, "clean, reliable low-cost services and the ability to send voice and data over the same line," Hodgson said.

IBM spokesmen also attempted to dispel what they called myths that ISDN and Systems Network Architecture (SNA) are competitors and that IBM has been dragging its feet in supporting and implementing ISDN. They cited the vendor's six- to seven-year involvement with ISDN standards committees and recent European site trials and demonstrations in which SNA applications ran over ISDN interfaces "untouched."

Replacing SNA

IBM will use ISDN in place of lower level SNA protocols "where appropriate," according to Frank Corr, senior technical staff member. IBM's plans for adapting SNA to ISDN could involve internal hardware integration or external boxes, Corr said. The vendor is also looking at changes to its communications architecture to take advantage of the higher ISDN bit rate.

In a separate interview, an IBM ISDN executive admitted that the vendor is having trouble identifying specific user applications that justify ISDN. "We keep coming back to this one help desk application," he said, referring to an application that allows a support person to call up the screen a user is having trouble with while talking to that user on the telephone.

The IBM executive also expressed doubt as to the immediate availability of low-cost ISDN tariffs, citing industry expectations that the divested Bell operating companies' ISDN tariffs will be priced 50% higher than comparable analog services. "IBM recognizes that ISDN will be the future. We have all kinds of plans; we're just not sure about the time frame," he said.

Cost savings to decide fate of ISDN

CCITT's Theo Irmer

Early user acceptance of Integrated Services Digital Network (ISDN) will depend on whether it offers cost savings over existing network services, Consultative Committee on International Telephone and Telegraph (CCITT) Director General Theo Irmer told IBM ISDN project members last week.

The technical feasibility of ISDN has already been demonstrated, Irmer said. "The fate of ISDN is in the hands of the customer, who will only migrate to the standard if it is economically attractive," he said.

Irmer's talk highlighted a three-day conference in which IBM employees engaged in ISDN-related work around the world convened to coordinate their projects.

Irmer called on service providers to share with users the economic benefits derived from the telecommunications standard, which include the ability to integrate a full range of services on one network instead of having to operate a number of dedicated networks in parallel.

CCITT has published a recommendation for ISDN tariff structures that "would give the network provider a reasonable return" but would be cost-driven rather than market-driven, Irmer said. Providers should also come up with "nondiscriminatory tariffs" that charge for 64K bit/sec. transmission "irrespective of the content" going over the line, he added. Irmer further adjured network providers not to implement "unnecessary specifications and limits" that could make it harder for users to move freely among different ISDN offerings. The ability to access a variety of network services from one interface is key, he said. Irmer rapped the knuckles of companies that have claimed ISDN products when they still do not have crucial components, such as the D channel that carries signaling between customer premise equipment and the switch.

The CCITT's efforts to finalize ISDN specifications are still running into resistance from the steadily increasing number of vendor representatives who attend meetings, Irmer reported. "It is wrong to assume that they will leave [their rivalry] at the door," Irmer said.

ELISABETH HORWITT

Netview

CONTINUED FROM PAGE 1

interface for network management across all IBM systems under the IBM Systems Application Architecture (SAA) umbrella.

- Knowledge-based network management systems, a technology that could take up to two years to develop.

Several users have expressed a need for automated Netview functions that can interpret and act on network events with minimal human intervention. "Netview/PC allows us to monitor [various non-IBM network equipment], but it doesn't help us make decisions," said W. Edward Hodgson, computer and communications manager at Westinghouse Electric Corp.

Tied down

Another common complaint is that Netview is still very much tied to a central IBM host. "More and more users are in a decentralized environment and resist being controlled from one point," said Dixon Doll, chairman of DMW Group, Inc., an Ann Arbor, Mich., consulting and software firm. "They want to do network management without having to put in a 3090, but a PC can't do it all either."

IBM laid the groundwork for distributed Netview/PC with two major introductions in the past year. Netview/PC provided the basic interface and communications facilities for networking devices to communicate with a Netview host. Netview Release 1.1 turned an IBM 9370 VM system into an unattended network management node that can respond automatically to routine network messages and can pass the rest on to a central host.

Users and third-party network vendors are telling IBM they need more tools to help them set up such a system, however, particularly when it comes to tailoring applications to individual needs and linking non-IBM networking products. One source of dissatisfaction is IBM's C List, a Netview application development tool that has been called "user-hostile" by some.

IBM representatives said addressing those complaints is a top priority. "My No. 1 requirement for Netview is to provide a significant high-level language capability," said Robert Bailey, product manager for network management products at IBM.

Procedural language due

Bailey's group is working on a procedural language for operators, which would be easy to learn and consistent with SAA. Also to come is a high-level language that systems programmers would use to generate interactions between central Netview hosts and distributed Netview and Netview/PC nodes.

If IBM's first priority is to help users develop applications to respond to specific events, a longer term project is knowledge-based systems that can make network management decisions based on a series of events or on past history, Bailey said. "We want to put knowledge-based programming between users and fault-isolation and problem-determination functions," he said. IBM also plans to link existing expert systems, such as its Yorktown Expert System/MVS, to Netview, he added.

Westinghouse has waited several years for IBM to come up with expert system applications for Netview, Hodgson said. "I want something to analyze information for me and tell me what's wrong." IBM has "talked artificial intelligence when it talks Netview futures, but we can't pin them down," he added.

IBM should introduce network management expert systems within an 18- to 24-month time frame, Bailey said. IBM also plans to expand the LU6.2 capabilities of Netview/PC. "Right now we just have generalized batch transfer to CICS," said Netview/PC Product Manager Jack Drescher.

IBM will migrate both Netview and Netview/PC to OS/2 Extended Edition. This will provide some much-needed power for the system by allowing users to run it on a multitasking PS/2 that can handle up to 32 ports, rather than on a PC, Bailey indicated. Vendors would also be able to use the PS/2 and Netview/PC as the basis for network management systems, Drescher said. This could eliminate the need for a separate workstation, in addition to the Netview/PC monitor, for each type of networking equipment, he said.

IBM has scheduled shipment of the PS/2 version of Netview/PC for March but has not officially announced an OS/2 Extended Edition version. The firm plans to provide peer-to-peer communications for Netview/PC nodes, Drescher said.

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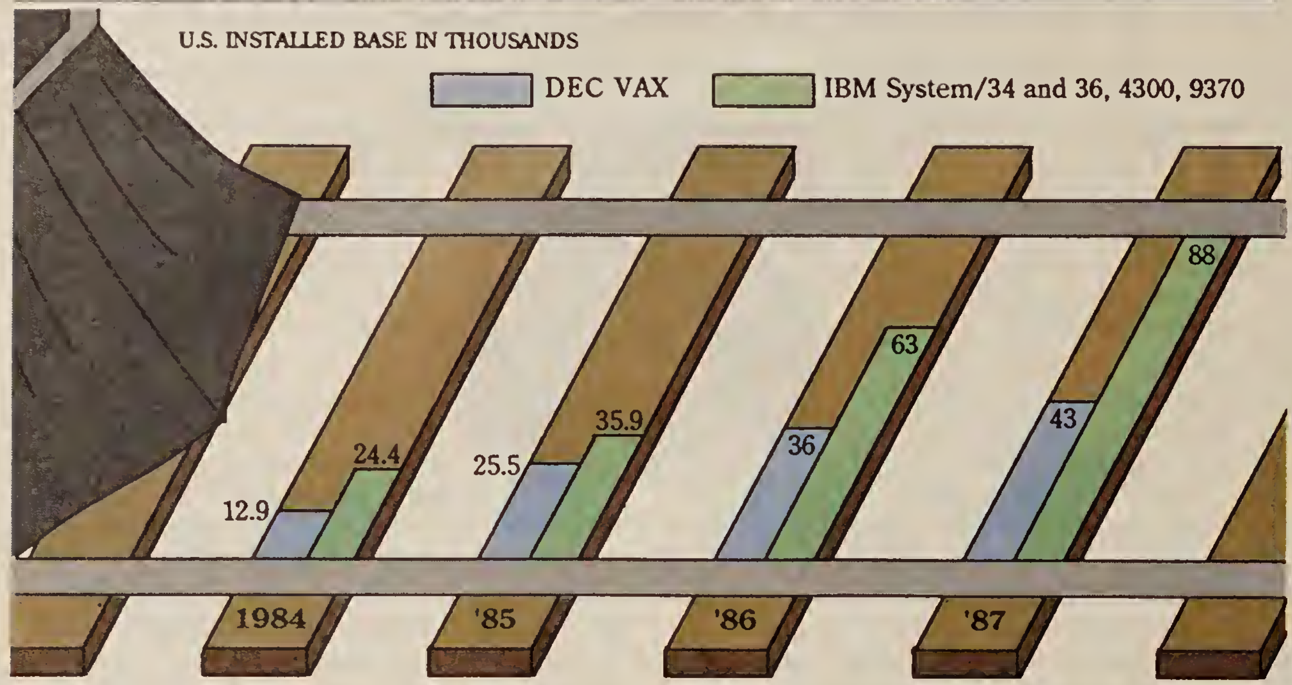
TRENDS

DEC VAX

DEC VAX growth on track with IBM mid-range



Digital Equipment Corp.'s recent success has not brought the firm up to parity with IBM's installed base, but the rivals are running parallel in growth of installations.

DEC, with its VAX series, and IBM, with its System/36 and 38, 4300 and 9370 mid-range systems, each more than tripled their bases between January 1984 and January 1987.

Analysts at Computer Intelligence Corp. (CI), the La Jolla, Calif., research firm that compiled the figures, said DEC kept up with IBM in the mid-range but that the numbers do not reflect direct competition between IBM and DEC because the systems are aimed at different markets. For example, few System/36s and 38s are used in laboratories, but CI said to watch for a few years to see what impact the 9370 has on DEC's base in technical computing.

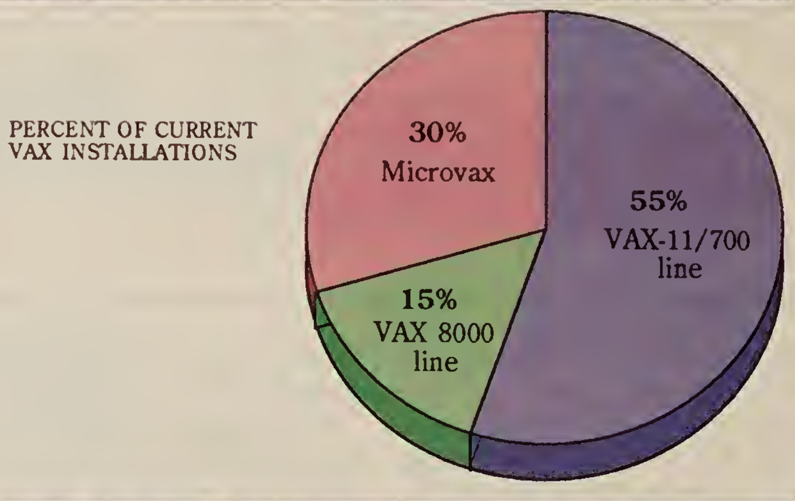
CI said 55% of the VAXs in Fortune 1,000 firms are VAX-11/700-type systems. VAX 8000s make up only 15% of the Fortune 1,000 installed base, but because they are more expensive and more powerful, they recently passed the 700 series in both installed value and power.

Most planned VAX purchases involve the low-end Microvax, a trend that CI said is likely to continue. CI's survey was conducted just before the Microvax 3500 and 3600 were announced in September.

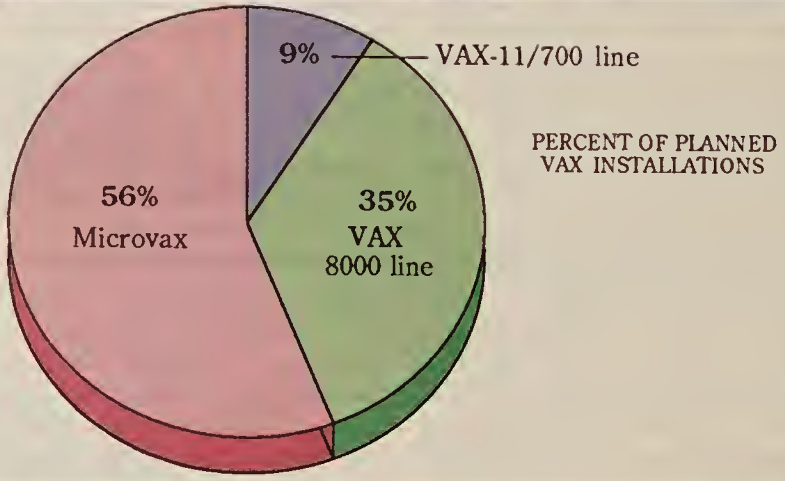
Only one of five Fortune 1,000 VAX sites — excluding Microvax-only locations — has Vaxclusters, but DEC's most powerful systems tend to be included in that 20%.

JAMES CONNOLLY

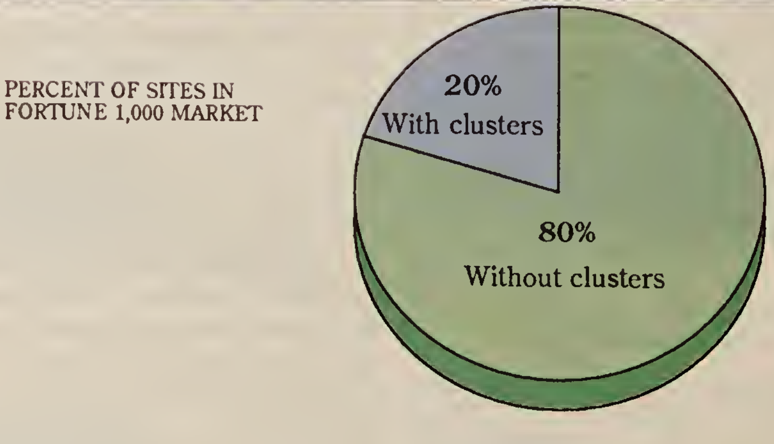
Older 11/700s prevail in Fortune 1,000



The Microvax comes on strong



One in five systems now in clusters



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHARTS: AMY J. SWANSON

INSIDE LINES

Hackles raised in Armonk. IBM last week vigorously denied published reports that some PS/2 Model 50s and 60s shipped to user sites were "dead on arrival" while others had problems recognizing peripherals. In an uncharacteristic statement challenging those reports, the company conceded that some problems involving the BIOS may cause the machines to display inaccurate time and date information. William C. Lowe, president of IBM's Entry Systems Division, told *Computerworld* Friday that Avon Products has had some problems with the PS/2s' not recognizing peripherals. But he said the problems were isolated and that Avon was the only firm he was aware of that had experienced this particular problem. Customers experiencing the time or date problem can obtain a device driver found in Reference Diskette Version 1.02, which is available through authorized IBM dealers.

Fear and loathing on Wall Street. MIS employees at E. F. Hutton had their resumes on the street last week within hours of renewed rumblings of a proposed acquisition of their firm by Shearson Lehman. The American Express subsidiary is expected to terminate 4,000 to 5,000 of Hutton's 18,000 employees if the acquisition occurs. A good number of those let go will undoubtedly come from Hutton's data processing and computer operations, Wall Street observers say. Shearson's MIS people may not come out of the merger unscathed, according to MIS recruitment companies contacted last week, which indicate an uptick in resume activity emanating from the firm's downtown headquarters. With brokerage firms throughout the industry instituting cutbacks, the expected terminations could not come at a worse time for MIS professionals who wish to stay on Wall Street.

So what's in a name, anyway? The chill of winter may be upon us, but that won't stop Los Angeles-based Nantucket Corp. from releasing its delayed Clipper Summer of 87 at the end of this month. Like other upgrades to Nantucket's Dbase compiler, Clipper Summer of 87 was named after the season in which it was initially expected to ship. But development problems have delayed the program's release by almost six months, leaving Nantucket in the awkward position of shipping a package that seems dated before it hits retailers' shelves.

Pronounce it "sippic." IBMers at the Raleigh R&D center have finally clarified the vendor's intentions for the mysterious Common Programming Interface for Communications (CPI/C), quietly announced in October. The interface provides a few simple commands that an application on any major IBM system can use to call up LU6.2 networking functions. This should make life easier for programmers who want to implement peer-to-peer networking but hate the idea of messing with LU6.2 each time they add a different type of IBM system. The first CPI/C version, due in October 1988, will run on VM/SP Releases 6 and 7; however, there will be CPI/Cs for other major IBM systems in the future.

The stork arrived on time. IBM stuck to its schedule and began delivery of OS/2 on Dec. 4. The company reported that 20,000 copies went out the door and showed a shrink-wrapped box to a *Computerworld* reporter as proof.

New Year's resolutions. Apple is targeting January for some important communications announcements related to the IBM world, a source said. Among the expected products is Apple's implementation of LU6.2, developed with Orion. Also slated for a January appearance are TCP/IP drivers supplied by Ungermann-Bass. Apple is supposed to release those specs next month. And let's not forget Apple's year-old promise of IBM Token-Ring compatibility.

Well, it was a nice thought. Disappointment and deadlock reportedly haunted last week's meeting of the Network Management and Gateway Monitoring Work Groups, which had hoped to reach a consensus on some initial specifications for TCP/IP network management and multivendor routing protocols. A decision has been postponed for about three months.

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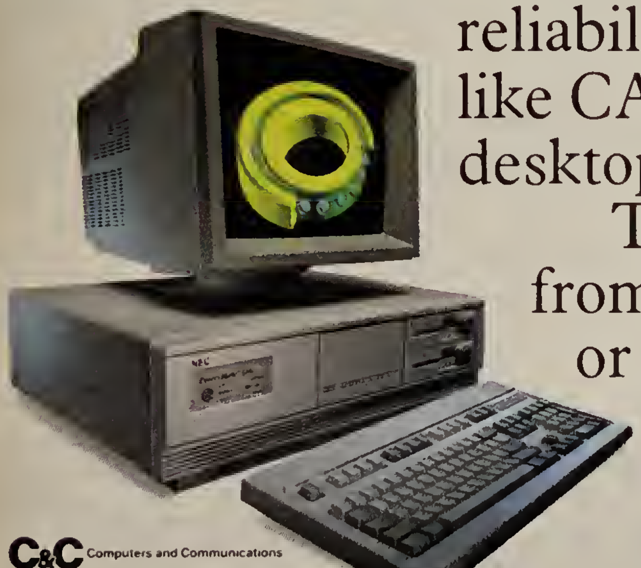

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